

Plug-in Reference



CUBASE ESSENTIAL₅

Personal Music Production System



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The included effect plug-ins

Introduction

This chapter contains descriptions of the included plug-in effects and their parameters.

In Cubase AI, the plug-in effects are arranged in a number of different categories. This chapter is arranged in the same fashion, with the plug-ins listed in separate sections for each effect category.

⇒ Most of the included effects are compatible with VST3, this is indicated by an icon in front of the name of the plug-in as displayed in plug-in selection menus (for further information, see the chapter “Audio Effects” in the Operation Manual).

Delay plug-ins

This section contains descriptions of the plug-ins in the “Delay” category.

MonoDelay

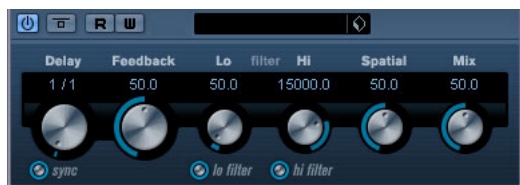


This is a mono delay effect that can either be tempo-based or use freely specified delay time settings.

The parameters are as follows:

Parameter	Description
Delay	This is where you specify the base note value for the delay if tempo sync is on (1/1–1/32, straight, triplet or dotted). If tempo sync is off, it sets the delay time in milliseconds.
Tempo sync on/off	The button below the Delay Time knob is used to turn tempo sync on or off. If set to off, the delay time can be set freely with the Delay Time knob, without sync to tempo.
Feedback	This sets the number of repeats for the delay.
Filter Lo	This filter affects the feedback loop of the effect signal and allows you to roll off low frequencies from 10Hz up to 800 Hz. The button below the knob activates/deactivates the filter.
Filter Hi	This filter affects the feedback loop of the effect signal and allows you to roll off high frequencies from 20kHz down to 1.2kHz. The button below the knob activates/deactivates the filter.
Mix	Sets the level balance between the dry signal and the effect. If MonoDelay is used as a send effect, this should be set to maximum as you can control the dry/effect balance with the send.

PingPongDelay



This is a stereo delay effect that alternates each delay repeat between the left and right channels. The effect can either be tempo-based or use freely specified delay time settings.

The parameters are as follows:

Parameter	Description
Delay	This is where you specify the base note value for the delay if tempo sync is on (1/1–1/32, straight, triplet or dotted). If tempo sync is off, it sets the delay time in milliseconds.
Tempo sync on/off	The button below the Delay Time knob is used to turn tempo sync on or off. If set to off, the delay time can be set freely with the Delay Time knob, without sync to tempo.
Feedback	This sets the number of repeats for the delay.
Filter Lo	This filter affects the feedback loop and allows you to roll off low frequencies up to 800Hz. The button below the knob activates/deactivates the filter.
Filter Hi	This filter affects the feedback loop and allows you to roll off high frequencies from 20kHz down to 1.2kHz. The button below the knob activates/deactivates the filter.
Spatial	This parameter sets the stereo width for the left/right repeats. Turn clockwise for a more pronounced stereo "ping-pong" effect.
Mix	Sets the level balance between the dry signal and the effect. If PingPongDelay is used as a send effect, this should be set to maximum as you can control the dry/effect balance with the send.

Distortion plug-ins

This section contains descriptions of the plug-ins in the "Distortion" category.

AmpSimulator



AmpSimulator is a distortion effect, emulating the sound of various types of guitar amp and speaker cabinet combinations. A wide selection of amp and cabinet models is available.

The parameters are as follows:

Parameter	Description
Drive	Governs the amount of amp overdrive.
Bass	Tone control for the low frequencies.
Middle	Tone control for the mid frequencies.
Treble	Tone control for the high frequencies.
Presence	Use this to boost or damp the higher frequencies.

Parameter	Description
Volume	This controls the overall output level.
Amplifier pop-up menu	This allows you to select between various amplifier models. Click on the currently selected amplifier name to open a pop-up with all the available amplifier models. This section can be bypassed by selecting "No Amp".
Cabinet pop-up menu	Various speaker cabinet models. Click on the currently selected cabinet name to open a pop-up with all the available amplifier models. This section can be bypassed by selecting "No Speaker".
Damping Lo/Hi	Further tone controls for shaping the sound of the selected speaker cabinet. Click on the values, enter a new value and press the [Enter] key.

DaTube



This effect emulates the characteristic warm, lush sound of a tube amplifier.

The parameters are as follows:

Parameter	Description
Drive	Regulates the pre-gain of the "amplifier". Use high values if you want an overdriven sound just on the verge of distortion.
Balance	This controls the balance between the signal processed by the Drive parameter and the dry input signal. For maximum drive effect, set this to its highest value.
Output	Adjusts the post-gain, or output level, of the "amplifier".

Distortion



Distortion will add crunch to your tracks.

The parameters are as follows:

Parameter	Description
Boost	Increases the distortion amount.
Feedback	This parameter feeds part of the output signal back to the effect input, increasing the distortion effect.
Tone	Lets you select a frequency range to which to apply the distortion effect.
Spatial	Changes the distortion characteristics of the left and right channel, thus creating a stereo effect.
Output	Raises or lowers the signal going out of the effect.

Dynamics plug-ins

This section contains descriptions of the plug-ins in the “Dynamics” category.

Gate



Gating, or noise gating, silences audio signals below a certain set threshold level. As soon as the signal level exceeds the set threshold, the gate opens to let the signal through.

The available parameters are as follows:

Parameter	Description
Threshold (-60–0dB)	This setting determines the level where Gate is activated. Signal levels above the set threshold trigger the gate to open, and signal levels below the set threshold will close the gate.
State LED	This indicates whether the gate is open (LED lights up in green), closed (LED lights up in red) or something in between (LED lights up in yellow).
Filter buttons	When the Side-Chain button (see below) is activated, you can use these buttons to set the filter type to either Low Pass, Band Pass or High Pass.
Side-Chain on/off	This button (below the Center knob) activates the filter. The input signal can then be shaped according to set Center and Q-Factor parameters which may be useful in tailoring how the Gate operates.
Center (50 Hz–20000 Hz)	Sets the center frequency of the filter.
Q-Factor (0.01–10000)	Sets the Resonance of the filter.
Monitor (On/Off)	Allows you to monitor the filtered signal.

Parameter	Description
Attack (0.1–1000ms)	This parameter sets the time it takes for the gate to open after being triggered. If the Live button (see below) is deactivated, it will ensure that the gate will already be open when a signal above the threshold level is played back. Gate manages this by “looking ahead” in the audio material, checking for signals loud enough to pass the gate.
Hold (0–2000ms)	This determines how long the gate stays open after the signal drops below the threshold level.
Release (10–1000ms or Auto mode)	This parameter sets the amount of time it takes for the gate to close (after the set hold time). If the Auto button is activated, Gate will find an optimal release setting, depending on the audio material.
Analysis (0–100) (Pure Peak to Pure RMS)	This parameter determines whether the input signal is analyzed according to Peak or RMS values (or a mixture of both). A value of 0 is pure Peak and 100 pure RMS. RMS mode operates using the average power of the audio signal as a basis, whereas Peak mode operates more on peak levels. As a general guideline, RMS mode works better on material with few transients such as vocals, and Peak mode better for percussive material, with a lot of transient peaks.
Live mode (On/Off)	When activated, Live mode disengages the “look ahead” feature of the Gate. Look ahead does produce more accurate processing but will add a certain amount of latency as a trade-off. When Live mode is activated, there is no latency, which might be better for “live” processing.

Limiter



Limiter is designed to ensure that the output level never exceeds a certain set output level, to avoid clipping in following devices. Limiter can adjust and optimize the Release parameter automatically according to the audio material, or it can be set manually. Limiter also features separate meters for the input, output and the amount of limiting (middle meters).

The available parameters are the following:

Parameter	Description
Input (-24--+24dB)	Allows you to adjust the input gain.
Output (-24--+6dB)	This setting determines the maximum output level.
Release (0.1–1000ms or Auto mode)	This parameter sets the amount of time it takes for the gain to return to its original level. If the Auto button is activated, Limiter will automatically find an optimal release setting that varies depending on the audio material.

MIDI Gate



Gating, in its fundamental form, silences audio signals below a certain set threshold level. That means, when a signal rises above the set level, the Gate opens to let the signal through while signals below the set level are cut off. MIDI Gate, however, is a Gate effect that is not triggered by threshold levels, but instead by MIDI notes. Hence it needs both audio and MIDI data to function.

Setting up

MIDI Gate requires both an audio signal and a MIDI input to function.

To set it up, proceed as follows:

1. Select the audio to be affected by the MIDI Gate.
This can be audio material from any audio track, or even a live audio input (provided you have a low latency audio card).
2. Select the MIDI Gate as an insert effect for the audio track.
The MIDI Gate control panel opens.

3. Select a MIDI track to control the MIDI Gate.

This can be an empty MIDI track, or a MIDI track containing data, it doesn't matter. However, if you wish to play the MIDI Gate in real-time – as opposed to having a recorded part playing it – the track has to be selected for the effect to receive the MIDI output.

4. Open the Output Routing pop-up menu for the MIDI track and select the MIDI Gate option.

The MIDI Output from the track is now routed to the MIDI Gate.

What to do next depends on whether you are using live or recorded audio and whether you are using real-time or re-recorded MIDI. We will assume for the purposes of this manual that you are using recorded audio, and play the MIDI in real-time.

Make sure the MIDI track is selected and start playback.

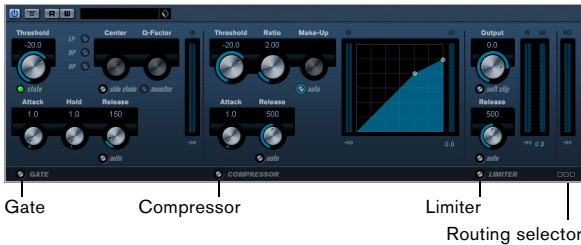
5. Now play a few notes on your MIDI keyboard.

As you can hear, the audio track material is affected by what you play on your MIDI keyboard.

The following MIDI Gate parameters are available:

Parameter	Description
Attack	This is used for determining how long it should take for the Gate to open after receiving a signal that triggers it.
Hold	Regulates how long the Gate remains open after a Note On or Note Off message (see Hold Mode below).
Release	This determines how long it takes for the Gate to close (in addition to the value set with the Hold parameter).
Note To Attack	The value you specify here determines to which extent the velocity values of the MIDI notes should affect the Attack. The higher the value, the more the Attack time will increase with high note velocities. Negative values will give shorter Attack times with high velocities. If you do not wish to use this parameter, set it to the 0 position.
Note To Release	The value you specify here determines to which extent the velocity values of the MIDI notes should affect the Release. The higher the value, the more the Release time will increase. If you do not wish to use this parameter, set it to the 0 position.
Velocity To VCA	This controls to which extent the velocity values of the MIDI notes determine the output volume. A value of 127 means that the volume is controlled entirely by the velocity values, while a value of 0 means that velocities will have no effect on the volume.
Hold Mode	Use this switch to set the Hold Mode. In Note-On mode, the Gate will only remain open for the time set with the Hold and Release parameters, regardless of the length of the MIDI note that triggered the Gate. In Note-Off mode on the other hand, the Gate will remain open for as long as the MIDI note plays, and then apply the Hold and Release parameters.

VSTDynamics



VSTDynamics is an advanced dynamics processor. It combines three separate processors: Gate, Compressor and Limiter, covering a variety of dynamic processing functions. The window is divided into three sections, containing controls and meters for each processor.

Activating the individual processors

You activate the individual processors using the buttons at the bottom of the plug-in panel.

The Gate section

Gating, or noise gating, is a method of dynamic processing that silences audio signals below a certain set threshold level. As soon as the signal level exceeds the set threshold, the gate opens to let the signal through. The Gate trigger input can also be filtered using an internal side-chain.

The available parameters are as follows:

Parameter	Description
Threshold (-60–0dB)	This setting determines the level where Gate is activated. Signal levels above the set threshold trigger the gate to open, and signal levels below the set threshold will close the gate.
state	This indicates whether the gate is open (LED lights up in green), closed (LED lights up in red) or something in between (LED lights up in yellow).
Side-Chain on/off	This button activates the internal side-chain filter. This lets you filter out parts of the signal that might otherwise trigger the gate in places you don't want it to, or to boost frequencies you wish to accentuate, allowing for more control over the gate function.
LP (Low pass), BP (Band pass), HP (High pass)	These buttons set the basic filter mode.
Center (50–22000Hz)	This sets the center frequency of the filter.

Parameter	Description
Q-Factor (0.001–10000)	This sets the resonance or width of the filter.
Monitor (On/Off)	Allows you to monitor the filtered signal.
Attack (0.1–100ms)	This parameter sets the time it takes for the gate to open after being triggered.
Hold (0–2000ms)	This determines how long the gate stays open after the signal drops below the threshold level.
Release (10–1000ms or Auto mode)	This parameter sets the amount of time it takes for the gate to close (after the set hold time). If the Auto button is activated, Gate will find an optimal release setting, depending on the audio material.

The Compressor section

Compressor reduces the dynamic range of the audio, making softer sounds louder or louder sounds softer, or both. Compressor functions like a standard compressor with separate controls for threshold, ratio, attack, release and make-up gain parameters. Compressor features a separate display that graphically illustrates the compressor curve shaped according to the Threshold, Ratio and MakeUp Gain parameter settings. Compressor also features a Gain Reduction meter that shows the amount of gain reduction in dB, and a program dependent Auto feature for the Release parameter.

The available parameters work as follows:

Parameter	Description
Threshold (-60–0dB)	This setting determines the level where Compressor “kicks in”. Signal levels above the set threshold are affected, but signal levels below are not processed.
Ratio (1:1–8:1)	Ratio determines the amount of gain reduction applied to signals over the set threshold. A ratio of 3:1 means that for every 3 dB the input level increases, the output level will increase by only 1 dB.
Make-Up (0–24dB)	This parameter is used to compensate for output gain loss, caused by compression. When Auto is on, gain loss will be compensated automatically.
Attack (0.1–100ms)	This determines how fast Compressor will respond to signals above the set threshold. If the attack time is long, more of the early part of the signal (attack) will pass through unprocessed.
Release (10–1000ms or Auto mode)	Sets the amount of time it takes for the gain to return to its original level when the signal drops below the Threshold level. If the Auto button is activated, Compressor will automatically find an optimal release setting that varies depending on the audio material.
Graphic display	Use the graphic display to graphically set the Threshold or the Ratio value.

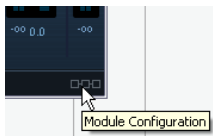
The Limiter section

Limiter is designed to ensure that the output level never exceeds a certain set output level, to avoid clipping in following devices. Conventional limiters usually require very accurate setting up of the attack and release parameters, to prevent the output level from going beyond the set threshold level. Limiter adjusts and optimizes these parameters automatically, according to the audio material. You can also adjust the Release parameter manually.

The available parameters are the following:

Parameter	Description
Output (-24--+6dB)	This setting determines the maximum output level. Signal levels above the set threshold are affected, but signal levels below are left unaffected.
Soft Clip (On/Off)	Soft Clipper acts differently compared to the limiter. When the signal level exceeds -6 dB, SoftClip starts limiting (or clipping) the signal "softly", at the same time generating harmonics which add a warm, tubelike characteristic to the audio material.
Release (10–1000ms or Auto mode)	This parameter sets the amount of time it takes for the gain to return to its original level when the signal drops below the threshold level. If the Auto button is activated, Limiter will automatically find an optimal release setting that varies depending on the audio material.

The Module Configuration button



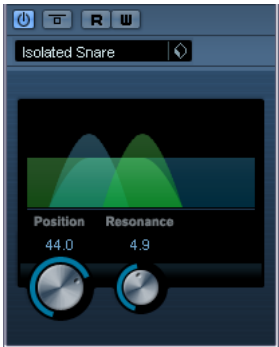
In the bottom right corner of the plug-in panel you will find a button with which you can set the signal flow order for the three processors. Changing the order of the processors can produce different results, and the available options allow you to quickly compare what works best for a given situation. Simply click the Module Configuration button to change to a different configuration. There are three routing options:

- C-G-L (Compressor-Gate-Limit)
- G-C-L (Gate-Compressor-Limit)
- C-L-G (Compressor-Limit-Gate)

Filter plug-ins

This section contains descriptions of the plug-ins in the "Filter" category.

DualFilter

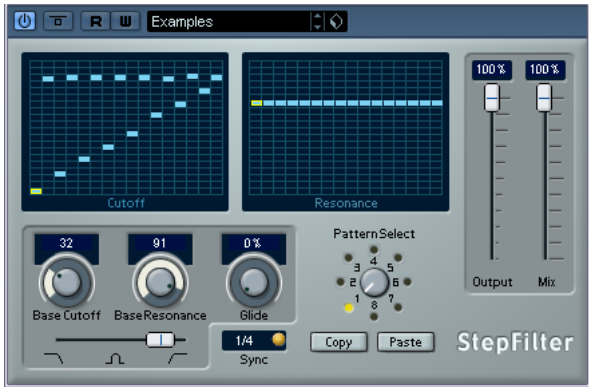


This effect filters out certain frequencies while allowing others to pass through.

The following parameters are available:

Parameter	Description
Position	This parameter sets the filter cutoff frequency. If you set this to a negative value, DualFilter will act as a low-pass filter. Positive values cause DualFilter to act as a high-pass filter.
Resonance	Sets the sound characteristic of the filter. With higher values, a ringing sound is heard.

StepFilter



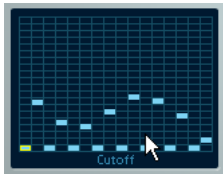
StepFilter is a pattern-controlled multimode filter that can create rhythmic, pulsating filter effects.

General operation

StepFilter can produce two simultaneous 16-step patterns for the filter cutoff and resonance parameters, synchronized to the sequencer tempo.

Setting step values

- Setting step values is done by clicking in the pattern grid windows.
- Individual step entries can be freely dragged up or down the vertical axis, or directly set by clicking in an empty grid box. By click-dragging left or right, consecutive step entries will be set to the pointer position.



Setting filter cutoff values in the grid window.

- The horizontal axis shows the pattern steps 1–16 from left to right, and the vertical axis determines the (relative) filter cutoff frequency and resonance setting. The higher up on the vertical axis a step value is entered, the higher the relative filter cutoff frequency or filter resonance setting.

- By starting playback and editing the patterns for the cut-off and resonance parameters, you can hear how your filter patterns affect the sound source connected to StepFilter directly.

Selecting new patterns

- Created patterns are saved with the project, and up to 8 different cutoff and resonance patterns can be saved internally. Both the cutoff and resonance patterns are saved together in the 8 Pattern memories.
- To select new patterns you use the pattern selector. New patterns are all set to the same step value by default.



Pattern Selector

Using pattern copy and paste to create variations

You can use the Copy and Paste buttons below the pattern selector to copy a pattern to another pattern memory location, which is useful for creating variations on a pattern.

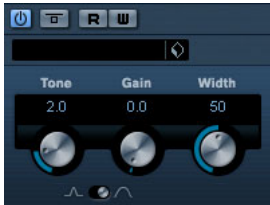
- Select the pattern you wish to copy, click the Copy button, select another pattern memory location and click Paste. The pattern is copied to the new location, and can now be edited to create variations using the original pattern as a starting point.

StepFilter parameters

Parameter/Value	Description
Base Cutoff	This sets the base filter cutoff frequency. Cutoff values set in the Cutoff grid window are values relative to the Base Cutoff value.
Base Resonance	This sets the base filter resonance. Resonance values set in the Resonance grid window are values relative to the Base Resonance value. Note that very high Base Resonance settings can produce loud ringing effects at certain frequencies.
Glide	This will apply glide between the pattern step values, causing values to change more smoothly.
Filter Mode	This slider selects between low pass (LP), band pass (BP) or high pass (HP) filter modes (from left to right respectively).
Sync 1/1 to 1/32 (Straight, Triplet or Dotted)	This sets the pattern beat resolution, i.e. what note values the pattern will play in relation to the tempo.

Parameter/ Value	Description
Output	Sets the overall volume.
Mix	Adjusts the mix between dry and processed signal.

ToneBooster

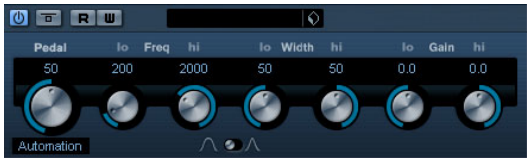


ToneBooster is a filter that allows you to raise the gain in a selected frequency range. It is particularly useful when inserted before AmpSimulator in the plug-in chain (see “AmpSimulator” on page 7), greatly enhancing the tonal varieties available.

The following parameters are available:

Parameter	Description
Tone	This sets the center filter frequency.
Gain	Allows you to adjust the gain of the selected frequency range by up to 24 dB.
Width	This sets the resonance of the filter.
Mode	This sets the basic operational mode of the filter; Peak or Band pass.

WahWah



WahWah is a variable slope band pass filter that can be auto-controlled via MIDI modeling the well-known analog pedal effect (see below). You can independently specify the frequency, width and the gain for the Lo and Hi Pedal positions. The crossover point between the Lo and Hi Pedal positions is at 50.

The parameters are as follows:

Parameter	Description
Pedal	This controls the filter frequency sweep.
Freq Lo/Hi	Sets the frequency of the filter for the Lo and Hi Pedal positions.
Width Lo/Hi	Sets the width (resonance) of the filter for the Lo and Hi Pedal positions.
Gain Lo/Hi	Sets the gain of the filter for the Lo and Hi Pedal positions.
Filter Slope	Specifies the slope of the filter; 6 dB or 12 dB.

MIDI control

For real-time MIDI control of the Pedal parameter, MIDI must be directed to the WahWah plug-in.

- Whenever the WahWah has been added as an insert effect (for an audio track or an FX channel), it will be available on the Output Routing pop-up menu for MIDI tracks. If WahWah is selected on the Output Routing menu, MIDI will be directed to the plug-in from the selected track.

Mastering – UV22HR



The UV22HR is a dithering plug-in, based on an advanced algorithm developed by Apogee. For an introduction to the concept of dithering, see the chapter “Audio Effects” in the Operation Manual.

The following options can be set in the UV 22 HR control panel:

Option	Description
Hi	Try this first, it is the most “all-round” setting.
Low	This applies a lower level of dither noise.
Auto black	When this is activated, the dither noise is gated (muted) during silent passages in the material.
Bit Resolution	The UV22HR supports dithering to multiple resolutions: 8, 16, 20 or 24 bits. You select the desired resolution by clicking the corresponding button.

⚠ Dither should always be applied post output bus fader.

Modulation plug-ins

This section contains descriptions of the plug-ins in the “Modulation” category.

AutoPan



This is a simple autopan effect. It can use different waveforms to modulate the left-right stereo position (pan), either using tempo sync or manual modulation speed settings.

The parameters are as follows:

Parameter	Description
Rate	If tempo sync is on, this is where you specify the base note value for tempo-syncing the effect (1/1 to 1/32, straight, triplet or dotted). If tempo sync is off, the auto-pan speed can be set freely with the Rate knob, without sync to tempo.
Tempo sync on/off	The button below the Rate knob is used to switch tempo sync on (the button lights up) or off.
Width	Sets the depth of the AutoPan effect.
Shape	Sets the modulation waveform. Sine and Triangle waveforms are available.
Side-Chain on/off	A signal routed to the Side-Chain input of the effect can control the Width parameter when this is activated. For a description of how to set up Side-Chain routing, see the chapter “Audio effects” in the Operation Manual.

Chorus



This is a single stage chorus effect. It works by doubling whatever is sent into it with a slightly detuned version.

The parameters are as follows:

Parameter	Description
Tempo sync on/off	The button below the Rate knob is used to switch tempo sync on or off. The button is lit when tempo sync is on.
Rate	If tempo sync is on, this is where you specify the base note value for tempo syncing the chorus sweep (1/1 to 1/32, straight, triplet or dotted). If tempo sync is off, the sweep rate can be set freely with the Rate knob, without sync to tempo.
Width	This determines the depth of the chorus effect. Higher settings produce a more pronounced effect.
Spatial	This sets the stereo width of the effect. Turn clockwise for a wider stereo effect.
Mix	Sets the level balance between the dry signal and the effect. If Chorus is used as a send effect, this should be set to maximum as you can control the dry/effect balance with the send.
Delay	This parameter affects the frequency range of the modulation sweep, by adjusting the initial delay time.
Shape	This changes the shape of the modulating waveform, altering the character of the chorus sweep. Sine and triangle waveforms are available.
Filter Lo/Hi	These parameters allow you to roll off low and high frequencies of the effect signal, respectively.

Flanger



Flanger is a classic flanger effect with added stereo enhancement.

The parameters are as follows:

Parameter	Description
Tempo sync on/off	The button below the Rate knob is used to switch tempo sync on or off. The button is lit when tempo sync is on.
Rate	If tempo sync is on, this is where you specify the base note value for tempo syncing the flanger sweep (1/1 to 1/32, straight, triplet or dotted). If tempo sync is off, the sweep rate can be set freely with the Rate knob, without sync to tempo.
Range Lo/Hi	This sets the frequency boundaries for the flanger sweep.
Feedback	This determines the character of the flanger effect. Higher settings produce a more "metallic" sounding sweep.
Spatial	This sets the stereo width of the effect. Turn clockwise for a wider stereo effect.
Mix	Sets the level balance between the dry signal and the effect. If the Flanger is used as a send effect, this should be set to maximum as you can control the dry/effect balance with the send.
Shape	This changes the shape of the modulating waveform, altering the character of the flanger sweep.
Delay	This parameter affects the frequency range of the modulation sweep, by adjusting the initial delay time.
Manual	If this is activated, the flanger sweep will be static, i.e. no modulation. You can instead change the sweep position manually by turning this knob.
Filter Lo/Hi	These parameters allow you to roll off low and high frequencies of the effect signal, respectively.

Metalizer



The Metalizer feeds the audio signal through a variable frequency filter, with tempo sync or time modulation and feedback control.

Parameter	Description
Feedback	The higher the value, the more "metallic" the sound.
Sharpness	Governs the character of the filter effect. The higher the value, the narrower the affected frequency area, producing sharper sound and a more pronounced effect.
Tone	Governs the feedback frequency. The effect of this will be more noticeable with high Feedback settings.
On button	Turns filter modulation on and off. When turned off, the Metalizer will work as a static filter.
Mono button	When this is on, the output of the Metalizer will be in mono.
Speed	If tempo sync is on, this is where you specify the base note value for tempo-syncing the effect (1/1 to 1/32, straight, triplet or dotted). Note that there is no note value modifier for this effect. If tempo sync is off, the modulation speed can be set freely with the Speed knob, without sync to tempo.
Tempo sync on/off	The button above the Speed knob is used to switch tempo sync on or off. The button is lit when tempo sync is on.
Output	Sets the overall volume.
Mix	Sets the level balance between the dry signal and the effect. If Metalizer is used as a send effect, this should be set to maximum as you can control the dry/effect balance with the send.

Phaser



Phaser produces the well-known “swooshing” phasing effect with additional stereo enhancement.

The parameters are as follows:

Parameter	Description
Tempo sync on/off	The button below the Rate knob is used to switch tempo sync on or off. The button is lit when tempo sync is on.
Rate	If tempo sync is on, this is where you specify the base note value for tempo syncing the phaser sweep (1/1 to 1/32, straight, triplet or dotted). If tempo sync is off, the sweep rate can be set freely with the Rate knob, without sync to tempo.
Width	The width of the modulation effect between higher and lower frequencies.
Feedback	This determines the character of the phaser effect. Higher settings produce a more pronounced effect.
Spatial	When using multi-channel audio, Spatial creates a 3-dimensional impression by delaying modulation in each channel.
Mix	Sets the level balance between the dry signal and the effect. If the Phaser is used as a send effect, this should be set to maximum as you can control the dry/effect balance with the send.
Manual	If this is activated, the phaser sweep will be static, i.e. no modulation. You can instead change the sweep position manually by turning this knob.
Filter Lo/Hi	These parameters allow you to roll off low and high frequencies of the effect signal, respectively.

Ringmodulator



The Ringmodulator can produce complex, bell-like enharmonic sounds. Ring modulators work by multiplying two audio signals. The ring modulated output contains added frequencies generated by the sum of, and the difference between, the frequencies of the two signals.

The Ringmodulator has a built-in oscillator that is multiplied with the input signal to produce the effect.

Parameter	Description
Oscillator LFO Amount	Controls how much the oscillator frequency is affected by the LFO.
Oscillator Env. Amount	Controls how much the oscillator frequency is affected by the envelope (which is triggered by the input signal). Positive and negative values can be set, with center position representing no modulation. Left of center, a loud input signal will decrease the oscillator pitch, whereas right of center the oscillator pitch will increase when fed a loud input.
Oscillator Wave	Selects the oscillator waveform; square, sine, saw or triangle.
Oscillator Range	Determines the frequency range of the oscillator in Hz.
Oscillator Frequency	Sets the oscillator frequency +/- 2 octaves within the selected range.
Oscillator Roll-Off	Cuts high frequencies in the oscillator waveform, to soften the overall sound. This is best used when harmonically rich waveforms are selected (e.g. square or saw).
LFO Speed	Sets the LFO Speed.
LFO Env. Amount	Controls how much the input signal level – via the envelope generator – affects the LFO speed. Positive and negative values can be set, with center position representing no modulation. Left of center, a loud input signal will slow down the LFO, whereas right of center a loud input signal will speed it up.

Parameter	Description
LFO Wave-form	Selects the LFO waveform; square, sine, saw or triangle.
Invert Stereo	This inverts the LFO waveform for the right channel of the oscillator, which produces a wider stereo perspective for the modulation.
Envelope Generator (Attack and Decay dials)	The Envelope Generator section controls how the input signal is converted to envelope data, which can then be used to control oscillator pitch and LFO speed. It has two main controls: Attack sets how fast the envelope output level rises in response to a rising input signal. Decay controls how fast the envelope output level falls in response to a falling input signal.
Lock L<R	When this button is enabled, the L and R input signals are merged, and produce the same envelope output level for both oscillator channels. When disabled, each channel has its own envelope, which affects the two channels of the oscillator independently.
Output	Sets the overall volume.
Mix	Adjusts the mix between dry and processed signal.

Parameter	Description
Slow	Fine adjustment of the high rotor Slow speed.
Fast	Fine adjustment of the high rotor Fast speed.
Accel.	Fine adjustment of the high rotor acceleration time.
Amp Mod	High rotor amplitude modulation.
Freq Mod	High rotor frequency modulation.
Slow	Fine adjustment of the low rotor Slow speed.
Fast	Fine adjustment of the low rotor Fast speed.
Accel.	Fine adjustment of the low rotor acceleration time.
Amp Mod	Adjusts amplitude modulation depth.
Level	Adjusts overall bass level.
Phase	Adjusts the phasing amount in the sound of the high rotor.
Angle	Sets the simulated microphone angle. 0 = mono, 180 = one mic on each side.
Distance	Sets the simulated microphone distance from the speaker in inches.
Output	Adjusts the overall output level.
Mix	Adjusts the mix between dry and processed signals.

Rotary



The Rotary plug-in simulates the classic effect of a rotary speaker. A rotary speaker cabinet features variable speed rotating speakers to produce a swirling chorus effect, commonly used with organs. Rotary features all the parameters associated with the real thing.

The parameters are as follows:

Parameter	Description
Speed (Stop/Slow/Fast)	This controls the speed of the Rotary in three steps.
Mode	Selects whether the Slow/Fast setting is a switch or a variable control. When switch mode is selected and Pitchbend is the controller, the speed will switch with an up or down flick of the bender. Other controllers switch at 64.
Speed Mod	Selects the Rotary speed from 0 (Stop) to 100 (Fast).
Overdrive	Applies a soft overdrive or distortion.
CrossOver	Sets the crossover frequency (200–3000Hz) between the low and high frequency loudspeakers.

Directing MIDI to the Rotary

For real-time MIDI control of the Speed parameter, MIDI must be directed to the Rotary.

- Whenever the Rotary has been added as an insert effect (for an audio track or an FX channel), it will be available on the Output Routing pop-up menu for MIDI tracks. If Rotary is selected on the "out:" menu, MIDI will be directed to the plug-in from the selected track.

Tranceformer

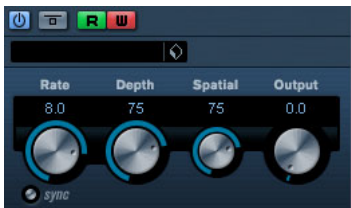


Tranceformer is a ring modulator effect, in which the incoming audio is ring modulated by an internal, variable frequency oscillator, producing new harmonics. A second oscillator can be used to modulate the frequency of the first oscillator, in sync with the Song tempo if needed.

Parameter	Description
Waveform buttons	Sets the pitch modulation waveform.
Tone	Sets the frequency (pitch) of the modulating oscillator (1 to 5000Hz).
Depth	Governs the depth of the pitch modulation.
Speed	If tempo sync is on, this is where you specify the base note value for tempo-syncing the effect (1/1 to 1/32, straight, triplet or dotted). Note that there is no note value modifier for this effect. If tempo sync is off, the modulation speed can be set freely with the Speed knob, without sync to tempo.
Tempo sync on/off	The button above the Speed knob is used to switch tempo sync on or off. The button is lit when tempo sync is on.
On button	Turns modulation of the pitch parameter on or off.
Mono button	Governs whether the output will be stereo or mono.
Output	Adjusts the output level of the effect.
Mix	Sets the level balance between the dry signal and the effect.

⇒ Note that clicking and dragging in the display allows you to adjust the Tone and Depth parameters at the same time!

Tremolo

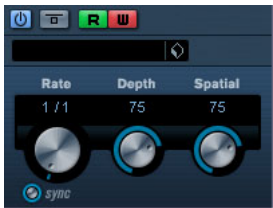


Tremolo produces amplitude (volume) modulation.

Parameters are as follows:

Parameter	Description
Rate	If tempo sync is on, this is where you specify the base note value for tempo-syncing the effect (1/1 to 1/32, straight, triplet or dotted). If tempo sync is off, the modulation speed can be set freely with the Rate knob, without sync to tempo.
Tempo sync on/off	The button below the Rate knob is used to switch tempo sync on or off. The button is lit when tempo sync is on.
Depth	This governs the depth of the amplitude modulation.
Spatial	This will add a stereo effect to the modulation.
Output	Adjusts the output volume.

Vibrato



The Vibrato plug-in produces pitch modulation.

Parameter	Description
Rate	If tempo sync is on, this is where you specify the base note value for tempo-syncing the effect (1/1 to 1/32, straight, triplet or dotted). If tempo sync is off, the modulation speed can be set freely with the Rate knob, without sync to tempo.
Tempo sync on/off	The button below the Rate knob is used to switch tempo sync on or off. The button is lit when tempo sync is on.
Depth	This governs the depth of the pitch modulation.
Spatial	This will add a stereo effect to the modulation.

Other plug-ins

This section contains descriptions of the plug-ins in the “Others” category.

Bitcrusher



If you're into lo-fi sound, Bitcrusher is the effect for you. It offers the possibility of decimating and truncating the input audio signal by bit reduction, to get a noisy, distorted sound. You can for example make a 24-bit audio signal sound like an 8 or 4-bit signal, or even render it completely garbled and unrecognizable. The parameters are:

Parameter	Description
Mode	Select one of four operating modes for the Bitcrusher. Each mode will produce a result sounding a bit different. Modes I and III are nastier and noisier, while modes II and IV are more subtle.
Sample Divider	This sets the amount by which the audio samples are decimated. At the highest setting (65), nearly all of the information describing the original audio signal will be eliminated, turning the signal into unrecognizable noise.
Depth	Use this to set the desired bit resolution. A setting of 24 gives the highest audio quality, while a setting of 1 will create mostly noise.
Output	Governs the output level from the Bitcrusher. Drag the slider upwards to increase the level.
Mix	This slider regulates the balance between the output from the Bitcrusher and the original audio signal. Drag the slider upwards for a more dominant effect, and drag it downwards if you want the original signal to be more prominent.

Chopper



Chopper is a combined tremolo and autopan effect. It can use different waveforms to modulate the level (tremolo) or left-right stereo position (pan), either using tempo sync or manual modulation speed settings. The parameters are as follows:

Parameter	Description
Waveform buttons	Sets the modulation waveform.
Depth	Sets the depth of the Chopper effect. This can also be set by clicking in the graphic display.
Speed	If tempo sync is on, this is where you specify the base note value for tempo-syncing the effect (1/1 to 1/32, straight, triplet or dotted). Note that there is no note value modifier for this effect. If tempo sync is off, the tremolo/auto-pan speed can be set freely with the Speed knob, without sync to tempo.
Tempo sync on/off	The button above the Speed knob is used to switch tempo sync on (the button lights up) or off.
Stereo/Mono button	Determines whether the Chopper will work as an auto-panner (button set to “Stereo”) or a tremolo effect (button set to “Mono”).
Mix	Sets the level balance between the dry signal and the effect. If Chopper is used as a send effect, this should be set to maximum.

Octaver



This plug-in can generate two additional voices that track the pitch of the input signal one octave and two octaves below the original pitch, respectively. Octaver is best used with monophonic signals. The parameters are as follows:

Parameter	Description
Direct	This adjusts the mix of the original signal and the generated voice(s). A value of 0 means only the generated and transposed signal is heard. By raising this value, more of the original signal is heard.
Octave 1	This adjusts the level of the generated signal one octave below the original pitch. Set to 0 means the voice is muted.
Octave 2	This adjusts the level of the generated signal two octaves below the original pitch. Set to 0 means the voice is muted.

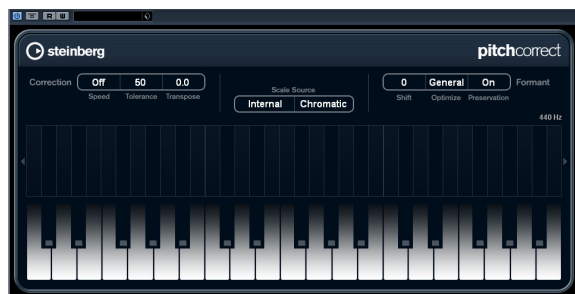
Tuner



This is a guitar tuner. Simply connect a guitar or other instrument to an audio input and select the Tuner as an insert effect (make sure you deactivate any other effect that alters pitch, like chorus or vibrato). When the instrument is connected, proceed as follows:

- **Play a note.**
The key is shown in the middle of the display. In addition, the frequency in Hz is shown in the bottom left corner and the octave range in the bottom right corner. If the key is wrong (e.g. if you wish to tune the E string and the key is shown as Fb), first tune the string so that the correct key is shown.
 - **The two arrows indicate any deviation in pitch by their position.** If the pitch is flat, they will be positioned in the left half of the display, if the pitch is sharp they will be in the right half.
The deviation is also shown (in Cent) in the upper area of the display.
 - **Tune the instrument so that the two arrows are in the middle.**
- Repeat this procedure for each string.

Pitch Shift – Pitch Correct



Pitch Correct automatically detects, adjusts and fixes slight pitch and intonation inconsistencies in monophonic vocal and instrumental performances in real time. The advanced algorithms of this plug-in preserve the formants of the original sound thus allowing for natural sounding pitch correction without the typical “Micky Mouse” effect.

Furthermore, you can use Pitch Correct creatively. You could e.g. create backing vocals by modifying the lead vocals or vocoder sounds by using extreme values. You can use an external MIDI controller, a MIDI track or the virtual keyboard to “play” a note or a scale of target pitches that determine the current scale notes to which the audio should be shifted. This allows you to change your audio in a very quick and easy way, which is extremely useful for live performances. In the keyboard display, the original audio will be displayed in blue while the changes are displayed in orange.

The parameters are:

Parameter	Description
Correction – Tolerance	This parameter determines the sensitivity of analysis. A low Tolerance value lets Pitch Correct find pitch changes quickly. When the Tolerance value is high, pitch variations in the audio (e.g. vibrato) will not be immediately interpreted as note changes.
Correction – Speed	With this parameter, you can determine the smoothness of the pitch change. Higher values cause the pitch shift to occur immediately. 100 is a very drastic setting that is designed mainly for special effects (e.g. the famous “Cher” effect).
Correction – Transpose (-12 to 12)	With this parameter you can adjust (or “retune”) the pitch of the incoming audio in semitone steps. You can set positive and negative values from -12 to 12. A value of zero means the signal is not Transposed.

Parameter	Description
Scale Source – Internal	If you choose the Internal option from the Scale Source pop-up, another pop-up menu will be shown to the right, where you can choose the key to which the source audio will be adapted. The available options are: Chromatic: The audio will be pitched to the closest semitone. Major/minor: The audio will be pitched to the major/minor scale specified in the pop-up menu to the right. This will be reflected on the keyboard display. Custom: The audio will be pitched to the notes that you specify by clicking the desired keys on keyboard display. If you want to reset the keyboard, click on the orange line below the display.
Scale Source – External MIDI Scale	Here you can specify how the audio should be changed by your external MIDI controller, the virtual keyboard or your MIDI track. The audio will be shifted to a scale of target pitches. Note that you have to assign the audio track as output for your MIDI track and that the Speed parameter has to be set to a value other than Off.
Scale Source – External MIDI Note	Here you can specify how the audio should be changed by your external MIDI controller, the virtual keyboard or your MIDI track. The audio will be shifted to a target note. Note that you have to assign the audio track as output for your MIDI track and that the Speed parameter has to be set to a value other than Off.
Formant – Shift (-60 to 60)	With this parameter you can change the natural timbre, i.e. the characteristic frequency components of the source audio.
Formant – Optimize (General, Male, Female)	With this parameter, you can specify the sound characteristics of the sound sources. While General is the default setting, Male is designed for low pitches and Female for high pitches.
Formant – Preservation (On/Off)	If you deactivate this button, formants are raised and lowered with the pitch, provoking strange vocal effects. Higher pitch correction values result in “Micky Mouse” effects, lower pitch correction values in “Monster” sounds. If you activate this button, the formants will be kept, maintaining the character of the audio.
Master Tuning	Detunes the output signal. The default setting is 440 Hz.

Restoration – Grungelizer



The Grungelizer adds noise and static to your recordings – kind of like listening to a radio with bad reception, or a worn and scratched vinyl record. The available parameters are as follows:

Parameter	Description
Crackle	This adds crackle to create that old vinyl record sound. The farther to the right you turn the dial, the more crackle is added.
RPM switch	When emulating the sound of a vinyl record, this switch lets you set the RPM (revolutions per minute) speed of the record (33/45/78 RPM).
Noise	This dial regulates the amount of static noise added.
Distort	Use this dial to add distortion.
EQ	Turn this dial to the right to cut off the low frequencies, and create a more hollow, lo-fi sound.
AC	This emulates a constant, low hum of AC current.
Frequency switch	This sets the frequency of the AC current (50 or 60Hz), and thus the pitch of the AC hum.
Timeline	This dial regulates the amount of overall effect. The farther to the right (1900) you turn this dial, the more noticeable the effect.

Reverb – RoomWorks SE



RoomWorks SE is a high-quality reverb plug-in. This plug-in has the following parameters:

Parameter	Description
Pre-Delay	The amount of time before the onset of reverb. This allows you to simulate larger spaces by increasing the time it takes for first reflections to reach the listener.
Reverb Time	Reverb Time in seconds.
Diffusion	This affects the character of the reverb tail. Higher diffusion is smoother while less diffusion can be clearer. This emulates changing the types of surfaces in a room (brick vs. carpet for instance).
High Level Amount	This affects the decay time of high frequencies. Normal room reverb decays quicker in the high and low frequency range than in the midrange. Lowering the level percentage will cause high frequencies to decay quicker. Values above 100% will cause high frequencies to decay longer than the midrange.
Low Level Amount	This affects the decay time of low frequencies. Normal room reverb decays quicker in the high and low frequency range than in the midrange. Lowering the level percentage will cause low frequencies to decay quicker. Values above 100% will cause low frequencies to decay longer than the midrange.
Mix	Determines the blend of dry (unprocessed) signal to wet (processed) signal. When using RoomWorks SE inserted in an FX channel, you will most likely want to set this to 100% or use the Send button.

Spatial plug-ins

This section contains descriptions of the plug-ins in the “Spatial” category.

MonoToStereo



This effect will turn a mono signal into a “pseudo-stereo” signal. The plug-in must be inserted on a stereo track playing a mono file to work.

The parameters are as follows:

Parameter	Description
Width	This controls the width or depth of the stereo enhancement. Turn clockwise to increase the enhancement.
Delay	This parameter increases the amount of differences between the left and right channels to further increase the stereo effect.
Color	This parameter also generates differences between the channels to increase the stereo effect.
Mono	This switches the output to mono, to check for possible unwanted coloring of the sound which sometimes can occur when creating an artificial stereo image.

StereoEnhancer



This plug-in will expand the stereo width of (stereo) audio material. It cannot be used with mono files.

The parameters are as follows:

Parameter	Description
Width	This controls the width or depth of the stereo enhancement. Turn clockwise to increase the enhancement.
Delay	This parameter increases the amount of differences between the left and right channels to further increase the stereo effect.
Color	This parameter also generates differences between the channels to increase the stereo enhancement.
Mono	This switches the output to mono, to check for possible unwanted coloring of the sound which sometimes can occur when enhancing the stereo image.

Introduction

This chapter contains descriptions of the included VST instruments and their parameters.

Prologue



Prologue is modelled on subtractive synthesis, the method used in classic analog synthesizers. It has the following basic features:

- **Multimode filter**
Variable slope low pass and high pass, plus band pass and notch filter modes – see [“About the filter types”](#) on [page 30](#).
- **Three oscillators**, each with 4 standard waveforms plus an assortment of specialized waveforms.
See [“Selecting Waveforms”](#) on [page 26](#).
- **Frequency modulation**.
See [“About frequency modulation”](#) on [page 28](#).
- **Ring Modulation**.
See [“Ring modulation”](#) on [page 29](#).
- **Built-in effects**.
See [“Effects \(EFX\) page”](#) on [page 34](#).
- **Prologue receives MIDI in Omni mode** (on all MIDI channels).
You don’t need to select a MIDI channel to direct MIDI to the Prologue.

Sound parameters

Oscillator section



This section contains parameters affecting the 3 oscillators. These are located in upper half of the instrument panel.

Selecting Waveforms

Each oscillator has a number of waveforms which are selectable by clicking on the waveform name in the box located in each oscillator section.



Selecting waveforms.

The following waveforms are available:

Waveform	Description
Sawtooth	This waveform contains all harmonics and produces a bright and rich sound.
Parabolic	This could be described as a “rounded” sawtooth waveform, producing a softer timbre.
Square	Square waveforms only contain odd number harmonics, which produces a distinct, hollow sound.
Triangle	The Triangle waveform generates only a few harmonics, spaced at odd harmonic numbers, which produces a slightly hollow sound.

Waveform	Description
Sine	The sine wave is the simplest possible waveform, with no harmonics (overtones). The sine wave produces a neutral, soft timbre.
Formant 1–12	Formant waveforms emphasizes certain frequency bands. Like the human voice, musical instruments have a fixed set of formants, which give it a unique, recognizable tonal color or timbre, regardless of pitch.
Vocal 1–7	These are also formant waveforms, but specifically vocal-oriented. Vowel sounds (A/E/I/O/U) are among the waveforms found in this category.
Partial 1–7	Partials, also called harmonics or overtones, are a series of tones which accompany the prime tone (fundamental). These waveforms could be described as producing intervals with two or more frequencies heard simultaneously with equal strength.
Reso Pulse 1–12	This waveform category begins with a complex waveform (Reso Pulse 1), that emphasizes the fundamental frequency (prime). For each consecutive waveform in this category, the next harmonic in the harmonic series is emphasized.
Slope 1–12	This waveform category begins with a complex waveform (Slope 1), with gradually decreasing harmonic complexity the higher the number selected. Slope 12 produces a sine wave (no harmonics).
Neg Slope 1–9	This category also begins with a complex waveform (NegSlope 1), but with gradually decreasing low frequency content the higher the number selected.

▪ To hear the signal generated by the oscillator(s), the corresponding Osc dial in the oscillator sections must be turned clockwise to a suitable value.

OSC 1 parameters

Oscillator 1 acts as a master oscillator. It determines the base pitch for all three oscillators. Oscillator 1 features the following parameters:

Parameter	Value	Description
Osc 1	0–100	This controls the output level of the oscillator.
Coarse	+/- 48 semitones	This determines the base pitch used by all oscillators.
Fine	+/- 50 cent	Fine tunes the oscillator pitch in cent increments (100th of a semitone). This also affects all oscillators.
Wave Mod	+/- 50	This parameter dial is only active if the Wave Mod button is activated beside the waveform selection box. Wave modulation works by adding a phase-shifted copy of the oscillator output to itself, which produces waveform variations. For example if a sawtooth waveform is used, activating WM will produce a pulse waveform. By modulating the WM parameter with for example a LFO, classic PWM (pulse width modulation) is produced. Wave modulation can, however, be applied to any waveform.
Phase button	On/Off	When Phase synchronization is activated, all oscillators will restart their waveform cycles with every note played. With Phase deactivated, the oscillators generate a waveform cycle continuously, which produces slight variations when playing as each note will start from a random phase in the cycle, adding warmth to the sound. But when synthesizing bass sounds or drum sounds, it is usually desired that the attack of every note played sounds the same, so for these purposes you should activate Phase sync. Phase sync also affects the noise generator.
Tracking button	On/Off	When Tracking is activated, the oscillator pitch will track the notes played on the keyboard. If Tracking is deactivated the oscillator pitch remains constant, regardless of what note is played.
Wave Mod button	On/Off	This switches wave modulation on or off.
Waveform pop-up	See “Selecting Waveforms” on page 26.	Sets the basic waveform for the oscillator.

OSC 2 parameters

Oscillator 2 has the following parameters:

Parameter	Value	Description
Osc 2	0–100	This controls the output level of the oscillator.
Coarse	+/- 48 semitones	This determines the coarse pitch for Osc 2. If FM is enabled, this determines frequency ratio of the oscillator regarding Osc 1.
Fine	+/- 50 cent	Fine tunes the oscillator pitch in cent increments (100th of a semitone). If FM is enabled, this determines the frequency ratio of the oscillator regarding Osc 1.
Wave Mod	+/- 50	This parameter dial is only active if the Wave Mod button is activated beside the waveform selection box. Wave modulation works by adding a phase-shifted copy of the oscillator output to itself, which produces waveform variations. For example if a sawtooth waveform is used, activating WM will produce a pulse waveform. By modulating the WM parameter with for example a LFO, classic PWM (pulse width modulation) is produced. Wave modulation can, however, be applied to any waveform.
Ratio	1–16	This parameter dial (which is only active if the Freq Mod button is activated) adjusts the amount of frequency modulation applied to oscillator 2, see “About frequency modulation” on page 28 . Is normally referred to as FM index.
Sync button	On/Off	When Sync is activated, Osc 2 is slaved to Osc 1. This means that every time Osc 1 completes its cycle, Osc 2 is forced to reset (start its cycle from the beginning). This produces a characteristic sound, suitable for lead playing. Osc 1 determines the pitch, and varying the pitch of Osc 2 produces changes in timbre. For classic sync sounds, try modulating the pitch of Osc 2 with an envelope or a LFO. The Osc 2 pitch should also be set higher than the pitch of Osc 1.
Tracking button	On/Off	When Tracking is activated, the oscillator pitch will track the notes played on the keyboard. If Tracking is deactivated the oscillator pitch remains constant, regardless of what note is played.
Freq Mod button	On/Off	This switches frequency modulation on or off.
Wave Mod button	On/Off	This switches wave modulation on or off.
Waveform selector pop-up	See “Selecting Waveforms” on page 26 .	Sets the basic waveform for the oscillator.

OSC 3 parameters

Oscillator 3 has the following parameters:

Parameter	Value	Description
Osc 3	0–100	This controls the output level of the oscillator.
Coarse	+/- 48 semitones	This determines the coarse pitch for Osc 3. If FM is enabled, this determines the frequency ratio of the oscillator regarding Osc 1/2.
Fine	+/- 50 cent	Fine tunes the oscillator pitch in cent increments (100th of a semitone). If FM is enabled, this determines the frequency ratio of the oscillator regarding Osc 1/2.
Ratio	1–16	This parameter dial (which is only active if the Freq Mod button is activated) adjusts the amount of frequency modulation applied to oscillator 3, see “About frequency modulation” on page 28 . Is normally referred to as FM index.
Sync button	On/Off	When Sync is activated, Osc 3 is slaved to Osc 1. This means that every time Osc 1 completes its cycle, Osc 3 is forced to reset (start its cycle from the beginning). This produces a characteristic sound, suitable for lead playing. Osc 1 determines the pitch, and varying the pitch of Osc 3 produces changes in timbre. For classic sync sounds, try modulating the pitch of Osc 3 with an envelope or a LFO. The Osc 3 pitch should also be set higher than the pitch of Osc 1.
Tracking button	On/Off	When Tracking is activated, the oscillator pitch will track the notes played on the keyboard. If Tracking is deactivated the oscillator pitch remains constant, regardless of what note is played.
Freq Mod button	On/Off	This switches frequency modulation on or off.
Wave Mod button	On/Off	This switches wave modulation on or off.
Waveform selector pop-up	See “Selecting Waveforms” on page 26 .	Sets the basic waveform for the oscillator.

About frequency modulation

Frequency modulation or FM means that the frequency of one oscillator (called the carrier) is modulated by the frequency of another oscillator (called the modulator).

- In Prologue, Osc 1 is the modulator, and Osc 2 and 3 are carriers.

Osc 2 could be said to be both carrier and modulator as if Freq Mod is applied to Osc 2 it is modulated by Osc 3. If Osc 2 also uses frequency modulation, Osc 3 will be modulated by both Osc 1 and Osc 2.

- The “pure” sound of frequency modulation is output through the modulator oscillator(s).
This means that you should turn off the Osc 1 output when using frequency modulation.
- The Freq Mod button switches frequency modulation on or off.
- The Ratio parameter determines the amount of frequency modulation.

Portamento

This parameter makes the pitch glide between the notes you play. The parameter setting determines the time it takes for the pitch to glide from one note to the next. Turn the knob clockwise for longer glide time.

The “Mode” switch allows you to apply glide only when you play a legato note (when switch is set to Legato). Legato is when you play a note without releasing the previously played note. Note that Legato mode only works with monophonic Parts.

Ring modulation

Ring modulators multiply two audio signals. The ring-modulated output contains added frequencies generated by the sum of, and the difference between, the frequencies of the two signals. In Prologue, Osc 1 is multiplied with Osc 2 to produce sum and difference frequencies. Ring modulation is often used to create bell-like sounds.

- To hear the ring modulation, you should turn down the output level for Osc 1 and 2, and turn up the “R.Mod” level all the way.
- If Osc 1 and 2 are tuned to the same frequency, and no modulation is applied to the Osc 2 pitch, nothing much will happen.
If you change the pitch of Osc 2, however, drastic changes in timbre can be heard. If the oscillators are tuned to a harmonic interval such as a fifth or octave, the ring modulated output will sound harmonic, other intervals will produce inharmonious, complex timbres.
- Oscillator Sync should be deactivated when using ring modulation.

Noise Generator

A noise generator generates noise (all frequencies at equal levels). Applications include simulating drum sounds and breath sounds for wind instruments.

- To hear only the sound of the noise generator, you should turn down the output level for the oscillators, and turn up the Noise parameter.
- The Noise generator level is routed to Envelope 1 by default.
See “Envelope page” on page 32 for a description of the Envelope generators.

Filter section



The circle in the middle contains the filter parameters. The central dial sets the filter cutoff parameter and the outer ring the filter type:

Parameter	Description
Filter type	Sets the filter type to either low pass, high pass, band pass or notch. The filter types are described in the table below.
Cutoff	This dial controls the filter frequency or “cutoff”. If a low pass filter is used, it could be said to control the opening and closing of the filter, producing the classic “sweeping” synthesizer sound. How this parameter operates is governed by the filter type mode (see the table below).
Emphasis	This is the resonance control for the filter. For low pass and high pass filters, raising the Emphasis value will emphasize the frequencies around the set cutoff frequency. This produces a generally thinner sound, but with a sharper, more pronounced cutoff sweep. The higher the filter Emphasis value, the more resonant the sound becomes until it starts to ring (self-oscillate), generating a distinct pitch. For Band pass or Notch filters, the Emphasis setting adjusts the width of the band. When you raise the value, the band where frequencies are let through (Band pass), or cut (Notch) will become narrower.
Drive	This can be used to adjust the filter input level. Levels above 0 dB will gradually introduce a soft distortion of the input signal, and a decrease of the filter resonance.

Parameter	Description
Shift	Internally, each filter consists of two or more “subfilters” connected in series. This parameter shifts the cutoff frequency of the subfilters. The result depends on the selected filter type: For Low pass and High pass filter types it changes the filter slope. For Band pass and Notch filter types it changes the bandwidth. The Shift parameter has no effect if either the 12dB LP or 12dB HP filter type is selected.
Tracking	If this parameter is set to values over the 12 o'clock position, the filter cutoff frequency will increase the further up on the keyboard you play. Negative values invert this relationship. If the Tracking parameter is set fully clockwise, the cutoff frequency will track the keyboard by a semitone per key.

About the filter types

You select which filter type to use using the buttons around the filter cutoff knob. The following filter types are available (listed clockwise from 9 o'clock):

Type	Description
12db LP	Low pass filters let low frequencies pass and cut out the high frequencies. This low pass filter has a gentler slope (12dB/Octave above the cutoff frequency), leaving more of the harmonics in the filtered sound.
18dB LP	This low pass filter also has a cascade design, attenuating frequencies above the cutoff frequency with a 18dB/Octave slope, as used in the classic TB 303 synth.
24dB LP	This filter type attenuates frequencies above the cutoff frequency with a 24dB/Octave slope, which produces a warm and fat sound.
24dB LP II	This low pass filter has a cascade design which attenuates frequencies above the cutoff frequency with a 24dB/Octave slope, which produces a warm and dark sound.
12dB Band	This band pass filter cuts both high and low frequencies above and below the cutoff frequency with a 12dB/Octave slope, producing a nasal and thin sound.
12dB Notch	This notch filter cuts off frequencies near the cutoff frequency by 12dB/Octave, letting the frequencies below and above through. This produces a phaser-like sound.
12dB HP	A high pass filter is the opposite of a low pass filter, cutting out the lower frequencies and letting the high frequencies pass. This high pass filter has a 12dB/Octave slope, giving a bright and thin sound.
24dB HP	This filter has a 24dB/Octave slope, giving a bright and sharp sound.

Master Volume and Pan

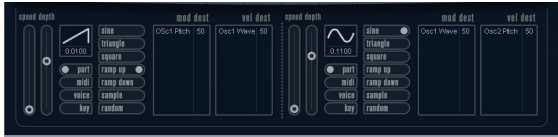


The master Volume controls the master volume (amplitude) of the instrument. By default this parameter is controlled by Envelope 1, to generate an amplitude envelope for the oscillators.

The Pan dial controls the position in the stereo spectrum for the instrument. You can use Pan as a modulation destination.

Modulation and controllers

The lower half of the control panel displays the various modulation and controller assignment pages available as well as the effect page. You switch between these pages using the buttons below the Filter section.



The following pages are available:

- The LFO page has two low frequency oscillators (LFOs) for modulating parameters – see below.
- The Envelope page contains the four Envelope generators which can be assigned to control parameters – see “Envelope page” on page 32.
- The Event page contains the common MIDI controllers (Mod wheel, Aftertouch, etc.) and their assignments – see “Event page” on page 33.
- The Effect page has three separate effect types available; Distortion, Delay and Modulation – see “Effects (EFX) page” on page 34.

LFO page

This is opened by clicking the LFO button at the top of the lower half of the control panel. The page contains all parameters and the modulation and velocity destinations for two independent LFOs. Depending on the currently selected Preset, there may already be modulation destinations assigned, in which case these are listed in the “Mod Dest” box for each LFO – see [“Assigning LFO modulation destinations”](#) on [page 31](#). A low frequency oscillator (LFO) is used for modulating parameters, for example the pitch of an oscillator (to produce vibrato), or for any parameter where cyclic modulation is desired.

The two LFOs have identical parameters:

Parameter	Description
Speed	This governs the rate of the LFO. If MIDI Sync is activated (see below), the available rate values are selectable as note values, e.g. beat increments of the sequencer tempo in Cubase AI.
Depth	This controls the amount of modulation applied by the LFO. If set to zero, no modulation is applied.
Waveform	This sets the LFO waveform.
Sync mode (Part/MIDI/Voice/Key)	This sets the sync mode for the LFO. See below for a description.

About the sync modes

The Sync modes determine how the LFO cycle affects the notes you play:

Parameter	Description
Part	In this mode, the LFO cycle is free running and will affect all the voices in sync. “Free running” means that the LFO cycles continuously, and doesn’t reset when a note is played.
MIDI	In this mode the LFO rate is synced in various beat increments to MIDI clock.
Voice	In this mode each voice in the Part has its own independent LFO cycle (the LFO is polyphonic). These cycles are also free running – each key down starts anywhere in the LFO cycle phase.
Key	Same as Voice except that it is not free running – for each key down the LFO cycle starts over.

About the waveforms

Most standard LFO waveforms are available for LFO modulation. You use Sine and Triangle waveforms for smooth modulation cycles, Square and Ramp up/down for different types of stepped modulation cycles and Random or Sam-

ple for random modulation. The Sample waveform is different. In this mode, one LFO actually samples and holds the values of the other LFO at the chosen frequency.

Assigning LFO modulation destinations

To assign a modulation destination for a LFO, proceed as follows:

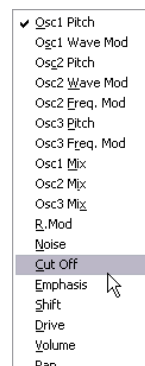
1. Click in the “Mod Dest” box for one of the LFOs.

A pop-up appears in which all possible modulation destinations are shown. All Sound parameters as well as most LFO and Envelope parameters are available as destinations.



Click here...

...to open the modulation destination pop-up.



2. Select a destination, e.g. Filter Cut Off.

The selected modulation destination is now shown in the list. Beside the destination, a default value (50) has been set. The value represents the modulation amount.

- You can set positive and negative modulation values by clicking on the value in the list, typing in a new value and pressing the Enter key.

To enter negative values type a minus sign followed by the value.

3. Select a suitable LFO Waveform, Speed, Depth and Sync mode.

You should now hear the filter cutoff being modulated by the LFO.

4. Using the same basic method, you can add any number of modulation destinations for the LFO.

They will all be listed in the “Mod Dest” box.

- To remove a modulation destination click on its name in the list and select “Off” from the pop-up.

Assigning LFO velocity destinations

You can also assign LFO modulation that is velocity controlled (i.e. governed by how hard or soft you strike a key). This is done as follows:

1. Click in the “Vel Dest” box for one of the LFOs.

A pop-up appears with all possible velocity destinations are shown.

2. Select a destination.

The selected velocity destination is now shown in the list. Beside the destination, a default value (50) has been set. The value represents the modulation amount. See below for an example of how velocity modulation works.

- You can set positive and negative values by clicking on the value in the list, typing in a new value and pressing the Enter key.

To enter negative values type a minus sign followed by the value.

3. Using the same basic method, you can add any number of velocity destinations for the LFO.

They will all be listed in the “Vel Dest” box.

- To remove a modulation destination click on its name in the list and select “Off” from the pop-up.

LFO modulation velocity control – an example:

If you follow the steps above and select the filter cutoff parameter as a Velocity destination, the following happens:

- The harder you strike the key, the more the filter cutoff parameter will be modulated by the LFO.
- If you enter a negative value for the velocity modulation amount, the opposite happens; the harder you play the less the filter cutoff is modulated by the LFO.

Envelope page

The Envelope page is opened by clicking the ENV button at the top of the lower half of the control panel. The page contains all parameters and the modulation and velocity destinations for the four independent envelope generators.

Envelope generators govern how a parameter value will change when a key is pressed, when a key is held and finally when a key is released.



On the Envelope page, the parameters for one of the four envelope generators is shown at a time.

- You switch between the four envelopes in the section to the left.

Clicking on either of the four mini curve displays 1 to 4 will select it and display the corresponding envelope parameters to the right. The mini curve displays also reflect the envelope settings for each corresponding envelope.

- Envelope generators have four parameters; Attack, Decay, Sustain and Release (ADSR).

See below for a description of these.

- You can set envelope parameters in two ways; either by using the sliders or by click-dragging the curve in the Envelope curve display.

You can also do this in the mini curve displays.

- By default Envelope 1 is assigned to the master volume, and therefore acts as an amplitude envelope. The amplitude envelope is used to adjust how the volume of the sound should change from the time you press a key until the key is released.

If no amplitude envelope were assigned, there would be no output.

The Envelope parameters are as follows:

Attack

The attack phase is the time it takes from zero to the maximum value. How long this should take, depends on the Attack setting. If the Attack is set to “0”, the maximum value is reached instantly. If this value is raised, it will take time before the maximum value is reached. Range is from 0.0 milliseconds to 91.1 seconds.

Decay

After the maximum value has been reached, the value starts to drop. How long this should take is governed by the Decay time parameter. The Decay time has no effect if the Sustain parameter is set to maximum. Range is from 0.0 milliseconds to 91.1 seconds.

Sustain

The Sustain parameter determines the level the envelope should rest at, after the Decay phase. Note that Sustain represents a level, whereas the other envelope parameters represent times. Range is from 0 to 100.

Release

Release determines the time it takes for the value to fall back to zero after releasing the key. Range is from 0.0 milliseconds to 91.1 seconds.

Punch

When Punch is activated, the start of the decay phase is delayed by a few milliseconds (i.e. the envelope remains at the top level for a moment before moving on to the decay phase). The result is a punchier attack similar to a compressor effect. This effect is more pronounced with short attack and decay times.

Retrigger

When Retrigger is activated, the envelope will re-trigger each time you play a new note. However, with certain textures/pad sounds and a limited number of voices it is recommended to leave the button deactivated, due to click noises that might occur, when the envelope is ended up abruptly. This is caused by the incoming re-trigger that forces the envelope to start over again.

Assigning Envelope modulation destinations

To assign a modulation destination for an Envelope, proceed as follows:

1. Click in the “Mod Dest” box for one of the Envelopes. A pop-up appears with all possible modulation destinations are shown. All Sound parameters as well as most LFO and Envelope parameters are available as destinations.

2. Select a destination, e.g. Filter Cut Off.

The selected modulation destination is now shown in the list. Beside the destination, a default value (50) has been set. The value represents the modulation amount.

- You can set positive and negative modulation values by clicking on the value in the list, typing in a new value and pressing the Enter key.

To enter negative values type a minus sign followed by the value.

3. Select a suitable envelope curve for the modulation.

You should now hear the filter cutoff being modulated by the envelope as you play.

4. Using the same basic method, you can add any number of modulation destinations for the envelope.

They will all be listed in the “Mod Dest” box.

- To remove a modulation destination click on its name in the list and select “Off” from the pop-up.

Assigning Envelope velocity destinations

You can also assign Envelope modulation that is velocity controlled (i.e. governed by how hard or soft you strike a key). This is done as follows:

1. Click in the “Vel Dest” box for one of the envelopes. A pop-up appears with all possible velocity destinations are shown.

2. Select a destination.

The selected velocity destination is now shown in the list. Beside the destination, a default value (50) has been set. The value represents the modulation amount. See below for an example of how velocity modulation works.

- You can set positive and negative values by clicking on the value in the list, typing in a new value and pressing the Enter key.

To enter negative values type a minus sign followed by the value.

3. Using the same basic method, you can add any number of velocity destinations for the Envelope.

They will all be listed in the “Vel Dest” box.

- To remove a modulation destination click on its name in the list and select “Off” from the pop-up.

Envelope modulation velocity control – an example:

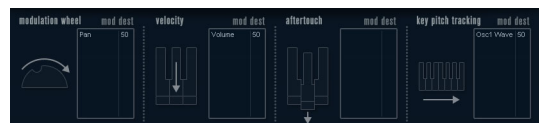
If you follow the steps above and select the filter cutoff parameter as a Velocity destination, the following happens:

- The harder you strike the key, the more the filter cutoff parameter will be modulated by the Envelope.

- If you enter a negative value for the velocity modulation amount, the opposite happens; the harder you play the less the filter cutoff is modulated by the Envelope.

Event page

The Event page is opened by clicking the EVENT button at the top of the lower half of the control panel. This page contains the most common MIDI controllers and their respective assignments.



The following controllers are available:

Controller	Description
Modulation Wheel	The modulation wheel on your keyboard can be used to modulate parameters.
Velocity	Velocity is used to control parameters according to how hard or soft you play notes on your keyboard. A common application of velocity is to make sounds brighter and louder if you strike the key harder.
Aftertouch	Aftertouch, or channel pressure, is MIDI data sent when pressure is applied to a keyboard after the key has been struck, and while it is being held down or sustained. Aftertouch is often routed to control filter cutoff, volume, and other parameters to add expression. Most (but not all) MIDI keyboards send Aftertouch.
Key Pitch Tracking	This can change parameter values linearly according to where on the keyboard you play.

To assign any of these controllers to one or several parameters, proceed as follows:

1. Click in the “Mod Dest” box for one of the controllers. A pop-up appears with all possible modulation destinations are shown. All Sound parameters as well as most LFO and Envelope parameters are available as destinations.

2. Select a destination.

The selected modulation destination is now shown in the list. Beside the destination, a default value (50) has been set. The value represents the modulation amount when the controller is at its full range.

- You can set positive and negative modulation values by clicking on the value in the list, typing in a new value and pressing the Enter key.

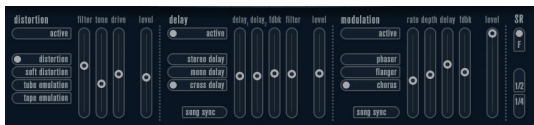
To enter negative values type a minus sign followed by the value.

3. Using the same basic method, you can add any number of modulation destinations for the controllers. They will all be listed in the “Mod Dest” box for the respective controller.

- To remove a modulation destination click on its name in the list and select “Off” from the pop-up.

Effects (EFX) page

This page features three separate effect units: Distortion, Delay and Modulation (Phaser/Flanger/Chorus). The EFX page is opened by clicking the EFX button at the top of the lower half of the control panel.



- Each separate effect section is laid out with a row of buttons that determine the effect type or characteristic and a row of sliders for making parameter settings.

- To activate an effect, click the “Active” button so that a dot appears.

Clicking again deactivates the effect.

Distortion

You can select between 4 basic distortion characteristics:

- Distortion provides hard clipping distortion.
- Soft Distortion provides soft clipping distortion.
- Tape Emulation produces distortion similar to magnetic tape saturation.
- Tube Emulation produces distortion similar to valve amplifiers.

The parameters are as follows:

Parameter	Description
Filter	This parameter sets the crossover frequency of the distortion filter. The distortion filter consists of a low pass filter and a high pass filter with a cutoff frequency equal to the crossover frequency.
Tone	This parameter controls the relative amount of low pass and high-pass filtered signal.
Drive	Sets the amount of distortion by amplifying the input signal.
Level	This controls the output level of the effect.

Delay

You can select between 3 basic delay characteristics:

- Stereo Delay has two separate delay lines panned left and right.
- In Mono Delay the two delay lines are connected in series for monophonic dual tap delay effects.
- In Cross Delay the delayed sound bounces between the stereo channels.

The parameters are as follows:

Parameter	Description
Song Sync	This switches tempo sync of the delay times on or off.
Delay 1	Sets the delay time ranging from 0ms to 728ms. If MIDI sync is activated the range is from 1/32 to 1/1; straight, triplet or dotted.
Delay 2	Same as Delay 1.
Feedback	This controls the decay of the delays. With higher settings the echoes repeat longer.

Parameter	Description
Filter	A low pass filter is built into the feedback loop of the delay. This parameter controls the cutoff frequency of this feedback filter. Low settings result in successive echoes sounding darker.
Level	This controls the output level of the effect.

Modulation

You can select between 3 basic modulation characteristics:

- The Phaser uses an 8-pole allpass filter to produce the classic phasing effect.
- The Flanger is composed of two independent delay lines with feedback for the left and the right channel respectively. The delay time of both delays is modulated by one LFO with adjustable frequency.
- Chorus produces a rich chorus effect with 4 delays modulated by four independent LFOs.

The parameters are as follows:

Parameter	Description
Song Sync	This switches tempo sync of the Rate parameter on or off.
Rate	Sets the rate of the LFOs modulating the delay time. If Song Sync is activated the rate will be synced to various beat increments.
Depth	This parameter controls the depth of the delay time modulation.
Delay	This parameter sets the delay time of the four delay lines.
Feedback	The feedback parameter controls the amount of positive or negative feedback for all four delay lines. The adjustable range is from -1 to 1.
Level	This controls the output level of the effect.

SR parameters

With these buttons you can change the sample rate. Lower sample rates basically reduces the high frequency content and sound quality, but the pitch isn't altered. This is a great way to emulate the "lo-fi" sounds of older digital synths!

- If button "F" is active, the selected Part's program will play back with the sample rate set in the host application.
- If button "1/2" is active, the selected Part's program will play back with half the original sample rate.
- If button "1/4" is active, the selected Part's program will play back with a quarter of the original sample rate.

- A bonus effect of using lower sample rates is that it reduces the load on the computer CPU, allowing more simultaneous voices to be played etc.

HALionOne



HALionOne is a sample player that can play sound content in the *.hsb (HALion Sound Bank) format. These samples have associated preset files that store the panel settings and reference the HSB samples. Included are several presets (as *.vstpreset and *.trackpreset files).

The operation of HALionOne is very simple; load a preset (a *.vstpreset or a *.trackpreset file for an Instrument Track) and start playing! You do, however, have the option to tweak the basic parameters to tailor the sound to your liking.

HALionOne parameters

The HALionOne differs from other VST Instruments in that the panel parameters shown can vary according to which parameters are stored in the HSB file. HSB files cannot be created with HALionOne, and HALionOne reads only the HSB files supplied with Cubase AI. In these files, certain parameters are assigned as part of the file and the associated program (or preset). This means that for each preset, only these assigned parameters are shown on the instrument panel. Typically, these are filter cutoff, DCA and DCF parameters and any assigned effect parameters (the effects are "built in").

If you load HALionOne for an Instrument track and select, for example, the “Draw Organ” preset, the following parameters are shown:

Parameter	Description
Cutoff	This allows you to adjust filter frequency or cutoff. The filter used is a Waldorf Low Pass filter with a 24 dB slope.
Resonance	Raising the filter resonance value will emphasize the frequencies around the set filter frequency.
DCF Amount	Controls the amount of the DCF (filter) envelope.
DCA Attack	Controls the time it takes for the DCA signal to reach its highest level.
DCA Decay	Controls the time it takes the DCA signal to decay to the sustain level.
DCA Sustain	Controls the DCA signal level after the Decay phase, as long as you press the key on your MIDI keyboard.
DCA Release	Controls the DCA signal after a key is released.
DCA Amount	Controls the amount of the DCA (amplifier) envelope.

These parameter assignments are used for many of the HALionOne presets, but not for all. As stated above, other parameters may be shown; these will be clearly labelled on the panel. For most of the presets there are also associated effects – the effect parameters are usually assigned to the quick controls on the right and typically control the dry/wet mix of the effect.

Effects Usage

- This button, located at the bottom right in the box displaying the preset name, allows you to bypass any effects. The blue LED beside the button is lit if any effects are used in the preset.

Efficiency slider

The Efficiency slider provides a way of balancing audio quality vs. conservation of computer power. The lower the setting, the more voices are available. As a trade-off, sound quality is reduced.

Voices allocated

- The Voices field dynamically displays the number of voices currently used.

MIDI and Disk activity LEDs

The MIDI activity LED indicates received MIDI input. The Disk LED will light up green when samples are streamed from disk, and red when samples cannot be loaded from disk in time. In such a case you should consider lowering the Efficiency slider. When the disk LED doesn't light up, samples are read from memory.

Locate Contents

If you have moved the HALionOne content files to a different location (i.e. any other location than the folder in which it was stored at installation time), you need to use the Locate Contents function to inform HALion One about where to find its files. This is done as follows:

- Right-click anywhere on the control panel and select “Locate contents”.

A file dialog opens where you can navigate to the folder location.

HALionOne and MIDI files

When the Preferences option “Import to Instrument Tracks” is activated (on the MIDI–MIDI File page), importing a MIDI file into Cubase AI will automatically set up instrument tracks, with HALionOne as the associated instrument. This allows you to quickly audition any imported MIDI files, to change parameter settings or to add effects, etc.

3

MIDI effects

Introduction

This chapter describes the included MIDI realtime effects and their parameters.

How to apply and handle MIDI effects is described in the chapter “MIDI realtime parameters and effects” in the Operation Manual.

Arpache 5



A typical arpeggiator accepts a chord (a group of MIDI notes) as input, and plays back each note in the chord separately, with the playback order and speed set by the user. The Arpache 5 arpeggiator does just that, and more. Before describing the parameters, let’s look at how to create a simple, typical arpeggio:

1. Select a MIDI track and activate monitoring (or record enable it) so that you can play “thru” the track.

Make sure that the track is properly set up for playback to a suitable MIDI instrument.

2. Select and activate the arpeggiator.

For now, use it as an insert effect for the selected track.

3. In the arpeggiator panel, use the Step Size setting to set the arpeggio speed.

The speed is set as a note value, relative to the project tempo. For example, setting Step Size to “16” means the arpeggio will be a pattern of sixteenth notes.

4. Use the Length setting to set the length of the arpeggio notes.

This allows you to create staccato arpeggios (Length value smaller than the Step Size setting) or arpeggio notes that overlap each other (Length value greater than Step Size).

5. Set the Key Range parameter to 12.

This will make the notes arpeggiate within an octave.

6. Play a chord on your MIDI instrument.

Now, instead of hearing the chord, you will hear the notes of the chord played one by one, in an arpeggio.

7. Try the different arpeggio modes by clicking the Play Order buttons.

The symbols on the buttons indicate the playback order for the notes (Invert, Up Only, etc.). The settings are described below.

Parameters

The Arpache 5 has the following settings:

Setting	Description
Play Order buttons	Allows you to select the playback order for the arpeggiated notes. The options are Normal, Invert, Up only, Down only, Random, User. If you select User, you can set the playback order manually using the 12 Play Order slots that are now shown at the bottom of the dialog.
Step Size	Determines the speed of the arpeggio, as a note value related to the project tempo. The range is 32T (1/32 note triplets) to “1.” (dotted note values).
Length	Sets the length of the arpeggio notes, as a note value related to the project tempo. The range is the same as for the Step Size setting.
Key Range	Determines the arpeggiated note range, in semitones counted from the lowest key you play. This works as follows: <ul style="list-style-type: none">– Any notes you play that are outside this range will be transposed in octave steps to fit within the range.– If the range is more than one octave, octave-transposed copies of the notes you play will be added to the arpeggio (as many octaves as fit within the range).

Setting	Description
Play Order slots	<p>If the User play order is selected, you can use these “slots” to specify a custom playback order for the arpeggio notes: Each of the 12 slots corresponds to a position in the arpeggio pattern. For each slot, you specify which note should be played on that position by selecting a number. The numbers correspond to the keys you play, counted from the lowest pressed key.</p> <p>So, if you play the notes C3-E3-G3 (a C major chord), “1” would mean C3, “2” would mean E3, and “3” would mean G3. Note that you can use the same number in several slots, creating arpeggio patterns that are not possible using the standard play modes.</p> <p>Please note that you need to begin with the left-most slot and then fill the slots to the right.</p>
MIDI Thru	<p>If this is activated, the notes sent to the arpeggiator (i.e. the chord you play) will pass through the plug-in (sent out together with the arpeggiated notes).</p>



Arpache SX



This is an even more versatile and advanced arpeggiator, capable of creating anything from traditional arpeggios to complex, sequencer-like patterns. The Arpache SX has two different modes: Classic and Sequence.

Classic vs. Sequence mode

The Classic mode determines the basic behavior of the Arpache SX. When Sequence mode is selected, the Arpache SX uses the events of an additional MIDI part as a pattern. This pattern then forms the basis for the arpeggio, in conjunction with the MIDI input.

Classic mode

The following parameters are available:

Parameter	Description
Direction	This allows you to choose how the notes in the chord you play should be arpeggiated. In Classic mode you can choose a value from a pop-up menu, in Sequence mode you will find additional options, see below.
One Shot Mode	Activate this option if you want the phrase to be played only once. When this option is deactivated, the phrase will be looped.
Transpose	When a setting other than “Off” is selected, the arpeggio will be expanded upwards, downwards or both (depending on the mode). This is done by adding transposed repeats of the basic arpeggio pattern.
Repeats	The “Repeats” setting sets the number of transposed repeats.
Pitch Shift	The “Pitch Shift” setting determines the transposition of each repeat.
MIDI Thru	If this is activated, the notes sent to the arpeggiator (i.e. the chord you play) will pass through the plug-in (sent out together with the arpeggiated notes).
Step Size	Determines the resolution of the arpeggio, i.e. its “speed” (in fixed note values or PPQ, if the PPQ button is activated). In Sequence mode you can also activate the “from sequence” option, see below.
Length	Determines the length of the arpeggio notes (in fixed note values or PPQ, if the PPQ button is activated). In Sequence mode you can also activate the “from sequence” option, see below.
Max. Polyphony	Determines how many notes should be accepted in the input chord. The “All” setting means there are no limitations.
Sort by	When you play a chord into the Arpache SX, the arpeggiator will sort the notes in the chord in the order specified here. For example, if you play a C-E-G chord, with “Note Lowest” selected, C will be the first note, E will be the second and G the third. This affects the result of the Arp Style setting.
Velocity	Determines the velocity of the notes in the arpeggio. Using the slider you can set a fixed velocity, or you can activate the “via Input” button to use the velocity values of the corresponding notes in the chord you play. In Sequence mode you can also activate the “from sequence” option, see below.

Sequence mode

In Sequence mode you can import a MIDI part into the Arpache SX by dragging it from the Project window and dropping it in the “Drop MIDI Sequence” field on the right of the Arpache SX panel.

Now, the notes in the dropped MIDI part will be sorted internally, either according to their pitch (“MIDI Seq. sort by pitch” checkbox activated) or according to their play order in the part. This results in a list of numbers. For example, if the notes in the MIDI part are C E G A E C and they are sorted according to pitch, the list of numbers will read 1 2 3 4 2 1. Here, there are 4 different notes/numbers and 6 trigger positions.

The MIDI input (the chord you send into the Arpache SX) will generate a list of numbers, with each note in the chord corresponding to a number depending on the “Sort by” setting.

Furthermore, the two lists of numbers will be matched – the Arpache SX tries to play back the pattern from the dropped MIDI part but using the notes from the MIDI input (chord). The result depends on the Play Mode setting:

Option	Description
Trigger	The whole pattern from the dropped MIDI file will be played back, but transposed according to one of the notes in the MIDI input. Which note is used for transposing depends on the Sort by setting.
Trigger Cnt.	As above, but even when all keys are released, the phrase continues playing from the last position (where it stopped), when a new key is pressed on the keyboard. This is typically used when playing “live” through the Arpache SX.
Sort Normal	Matches the notes in the MIDI input with the notes in the dropped MIDI part. If there are fewer notes (numbers) in the MIDI input, some steps in the resulting arpeggio will be empty.
Sort First	As above, but if there are fewer notes in the MIDI input, the missing notes will be replaced by the first note.
Sort Any	As above, but if there are fewer notes in the MIDI input, the missing notes will be replaced by any (random) note.
Arp. Style	As above, but if there are fewer notes in the MIDI input, the missing notes will be replaced by the last valid note in the arpeggio.
Repeat	In this mode, the chords played will not be separated into notes. Instead they will be used as is, and only the rhythm of the dropped MIDI part is used for playback.

Note also that you can choose to keep the original note timing, note length and note velocities from the dropped MIDI part, by selecting “from sequence” for the Step Size, Length and Velocity options.

Auto LFO



This plug-in works like an LFO in a synthesizer, allowing you to send out continuously changing MIDI controller messages. One typical use for this is automatic MIDI panning, but you can select any MIDI continuous controller event type. The Auto LFO effect has the following parameters:

Waveform

These settings determine the shape of the controller curves sent out. You can click on a waveform symbol, or choose a value from the pop-up menu.

Wavelength

This is where you set the speed of the Auto LFO, or rather the length of a single controller curve cycle. Using the slider or by choosing an entry from the pop-up menu, you can set this to rhythmically exact note values (or PPQ values if the PPQ button is activated). The lower the note value, the slower the speed. For example, if you set this to “1/8”, the waveform will be repeated every eighth note.

Controller Type

Determines which continuous controller type is sent out. Typical choices would include pan, volume and brightness, but your MIDI instrument may have controllers mapped to various settings, allowing you to modulate the synth parameter of your choice – check the MIDI implementation chart for your instrument for details!

Density

This determines the density of the controller curves sent out. The value can be set to “small”, “medium”, or “large”, or to rhythmically exact note values (by choosing from the pop-up menu). The higher the note value, the smoother the controller curve. For example, if you set this to “1/16”, a new controller event will be sent out at every 1/16 note position.

Value Range

These two sliders are used to determine the range of controller values sent out, i.e. the “bottom” and “top” of the controller curves.

Beat Designer

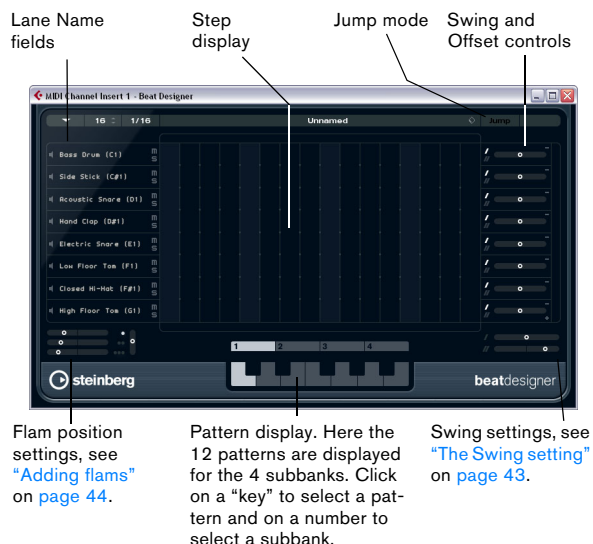
The Beat Designer is a MIDI pattern sequencer that allows you to create your own drum parts or “patterns” for a project. With the Beat Designer, you can quickly and easily set up the drums for a project, by experimenting and creating new drum sequences from scratch.

Normally, you will work on a short sequence, adjusting and modifying it while playing it back in a loop until you get the desired result. The drum patterns can then either be converted to MIDI parts on a track or triggered using MIDI notes during playback, see [“Converting patterns into MIDI parts”](#) on [page 45](#) and [“Triggering patterns”](#) on [page 45](#).

To use the Beat Designer, select it as MIDI insert effect for a MIDI track (routed to a VSTi or an external device) or an instrument track.

Overview

When you open the control panel for the Beat Designer for the first time, it shows a display with 8 empty lanes, each containing 16 steps.



Patterns and subbanks

The Beat Designer patterns are saved as pattern banks. One pattern bank contains 4 subbanks which in turn contain 12 patterns each.

In the pattern display in the lower part of the Beat Designer, subbanks and patterns are displayed graphically. To select a subbank, click on a number (1 to 4) at the top of the display. To select a pattern within this subbank, click on a “key” in the keyboard display below.

Initial settings

The steps represent the beat positions in the pattern. You can specify the number of steps and the step resolution globally for a pattern:

- Click in the “Number of steps for this pattern” value field and enter the desired value.

The maximum number of steps is 64. By default, 16 steps are shown.

- The playback length, i.e. the note value for the steps, can be specified in the Step resolution pop-up menu next to the Number of Steps setting.

On this menu, you can also set triplet values. These also affect the Swing setting, see [“The Swing setting”](#) on [page 43](#). The default setting is 1/16.



Number of steps for this pattern

Step resolution

Selecting drum sounds

To specify a drum sound, click in the drum name field for a lane and select the desired drum sound from the pop-up menu. The available drum sounds depend on the selected drum map. If no drum map is selected for the track, the GM (General MIDI) drum names are used.

- To find the right sound, you can audition the selected drum sound by clicking the Preview Instrument button (the speaker icon).

Entering drum steps

To enter a drum step, click on the step field where you want to add a beat. You could e.g. add a snare drum on each downbeat for a lane and a bass drum on a second lane. When you click in an empty field, it becomes “filled”, indicating that you will hear a drum beat on this step.

You can also click and drag to enter a continuous range of drum steps.

⇒ When working on drum patterns, it is a good idea to play back a section of the project in a loop while inserting the drum sounds, as this allows you to hear the result immediately.

Removing steps

- To remove a drum step, simply click on the corresponding field again.
- To remove a range of drum steps, click and drag over them.

Setting the velocity

When entering a drum step, the velocity setting of this step is determined by where you click: Click in the upper part of a step for the highest velocity setting, in the middle section for a medium velocity and in the lower part for the lowest velocity setting. This is a quick way of roughly setting the velocity on the fly while entering drum sounds. In the display, the different velocity settings are indicated by different colors.

- You can fine-tune the velocity setting for an existing drum step by clicking on it and dragging up or down. The current velocity is indicated numerically while you drag, allowing you to find the desired setting easily. The available range is from 1 to 127.
- You can also fine-tune the velocity for a range of drum steps. Click on the first step, drag up or down to enter into velocity edit mode, and then drag sideways and up or down to modify the velocity for all the steps.
- If you hold down [Shift] while dragging up or down, you can change the velocity for all steps on a lane.

⇒ If you change the velocity for several steps at the same time, the relative velocity differences will be kept for as long as possible (until the minimum or maximum setting is reached).

The velocity for the steps will be increased or decreased by the same amount.

- You can also create a crescendo (or decrescendo) for an existing range of drum steps by holding down [Alt]/[Option], clicking on the first step, dragging up or down and then dragging to the left or right.

Editing operations

- You can move all drum steps on a lane by holding down [Shift], clicking on the lane and dragging to the left or right.
- You can also “invert” a lane, i.e. add drum sounds for all steps that were empty while removing all existing drum steps. This lets you create unusual rhythmic patterns. To do so, hold down [Alt]/[Option] and drag the mouse over the lane.
- You can copy the content of a lane onto another lane by holding down [Alt]/[Option], clicking in the section to the left of the lane you want to copy and dragging to the desired position.

When you drag, a vertical line and a plus symbol will be displayed.

Lane handling

If you find that you have too many or too few lanes in the Beat Designer, you can add or remove them.

- To add a lane, click on the “Add Instrument Lane” button at the bottom right of the last lane shown.
- To remove a lane, click on the “Remove Instrument Lane” button in the controls section at the far right of the lane.
- You can change the order of the drum lanes by clicking in an empty area in the section to the left of a lane (i.e. not on a button) and dragging it to another position.
- You can mute or solo a lane by clicking the respective buttons to the left of the step display.

⚠ The lane operations always affect all patterns in the Beat Designer instance, not only the one you edit.

The Edit menu



This menu contains the following editing functions:

Option	Description
Shift Left	This moves all steps of the current pattern (all steps on all lanes) to the left.
Shift Right	This moves all steps of the current pattern (all steps on all lanes) to the right.
Reverse	Reverses the pattern, so that it plays backwards.
Copy Pattern	This copies the pattern to the clipboard. Copied patterns can be pasted into another pattern subbank (see below), and even directly into the project. The default key command for this is [Ctrl]/[Command]-[C].
Paste Pattern	Allows you to paste a complete pattern, e.g. into another pattern subbank, even into another instance of the Beat Designer. This is handy when you want to create variations based on existing patterns. The default key command for this is [Ctrl]/[Command]-[V].
Clear Pattern	This resets the current pattern.
Insert Pattern at Cursor	This creates a MIDI part for the current pattern and inserts it in the Project window, at the position of the project cursor (see also “Converting patterns into MIDI parts” on page 45).

Option	Description
Insert Subbank at Cursor	This creates a number of MIDI parts (one for each used pattern in the subbank) and inserts them one after the other, starting at the project cursor (see also “Converting patterns into MIDI parts” on page 45).
Insert Pattern at Left Locator	This creates a MIDI part for the current pattern and inserts it in the Project window, at the left locator (see also “Converting patterns into MIDI parts” on page 45).
Insert Subbank at Left Locator	This creates a number of MIDI parts (one for each used pattern in the subbank) and inserts them one after the other, starting at the left locator (see also “Converting patterns into MIDI parts” on page 45).
Fill Loop with Pattern	This creates a MIDI part for the current pattern and inserts it in the Project window as often as needed to fill the current loop area (the space between the left and right locators), see also “Converting patterns into MIDI parts” on page 45.

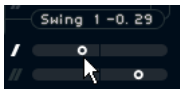
- You can set up key commands for the Insert options and the Fill Loop command in the Key Commands dialog. How to set up and use key commands is described in the chapter “Key Commands” in the Operation Manual.

The Swing setting

This parameter can be used to create a swing or shuffle rhythm, which allows you to add a more human feel to drum patterns that might otherwise be too static. This is done by offsetting every second drum step for a lane. If a triplet step resolution is used, every third drum step will be offset instead.

In the lower right section of the Beat Designer panel, you can find two Swing sliders. Dragging a slider to the right will delay every second (or third, see above) drum step in the pattern. Dragging to the left will make them play a little earlier.

You can set up two swing settings with these sliders and then quickly switch between these during playback. By default, the first swing setting is used (activated) in all lanes, but the slider is set to zero (middle position). Change the setting for this slider to hear how the pattern’s feel changes.



Drag the upper fader to set swing setting I and the lower fader to set swing setting II.

You can switch between the two swing settings using the Swing buttons to the right of the step display.



Click on the buttons to select the respective swing setting or click on a selected button to deactivate swing for this lane.

Adding flams

The Flam parameter lets you add flams (short secondary drum hits just before or after the actual main drum beat).

You can add up to three flams for each pattern step:

1. Click in the lower left corner of the step you want to add a flam to.

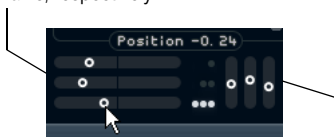
Little squares appear in the step when you point with the mouse at the step. After you clicked, the first square becomes filled to indicate that you added a flam.

Click here to add up to three flams to the step.



2. Click again to add the second and third flam, if needed.
3. In the lower left section of the Beat Designer panel you can make settings for the flams you created.

Here, you can specify the flam positions for all steps containing one, two and three flams, respectively.



With these sliders, you can specify the velocity for the separate flams.

- The first (topmost) Position slider specifies the flam position for all steps containing one single flam, the second slider the flam positions for all steps containing two flams, and the third slider the flam position for all steps containing three flams.
- Drag a Position slider to the left to add the flams before the drum step and to the right to add them after the step.

- When you add flams before the very first drum step in a pattern, this is indicated in the display by a small arrow in the top left corner of this step. This indicates that you have to treat this pattern with special care in playback and arranging. Starting playback at the normal pattern start would result in these flams not being played.

- Use the vertical sliders to the right of the flam sliders to set the velocity for the flams.

4. Start playback to hear the flams you created.

Offsetting lanes

To the right of the step display, you can find the Offset sliders for the lanes. These allow you to offset all drum steps on this lane. Drag a slider to the left to make the drum steps start a little earlier and to the right to let them start later.

Playing e.g. the bass drum or snare a little earlier allows you to add more “urgency” to the drums, delaying these drum sounds will result in a more relaxed drum pattern. Experiment with the settings to find out which fit best in your project.

Note that this function can also be used to correct faulty drum samples: If a drum sound has an attack that is slightly late, simply adjust the Offset slider for the lane.

Saving and loading presets

You can save all 48 Beat Designer patterns as a pattern bank. This can then be loaded in other projects. Pattern banks contain all the step and lane settings for a pattern (Mute and Solo, number and order of the lanes, pitch, etc.).

To save a pattern bank, proceed as follows:

1. In the Beat Designer, click on the Preset Management button to the right of the preset name field.



2. On the pop-up menu select “Save Preset”. A dialog appears.
3. Enter a name for the preset and click OK.

The preset will now be available on the Preset browser, in the MediaBay and on the Apply Track preset pop-up menu in the Track list.

Pattern banks are handled much like Track presets in the MediaBay. For further information, refer to the chapters “The MediaBay” and “Track Presets” in the Operation Manual.

Using the drum patterns in your project

You can use the drum patterns created with the Beat Designer in two ways: either by converting them to MIDI parts on a MIDI or Instrument track or by triggering the different patterns using MIDI notes.

Converting patterns into MIDI parts

You can convert the drum patterns created in the Beat Designer into a MIDI part by dragging them into the Project window.

Proceed as follows:

1. Set up one or more patterns of the same subbank.
2. In the lower part of the window, click on a pattern or subbank and drag it at the desired position onto a MIDI or instrument track in the Project window.

If you drag the pattern or subbank to an empty area in the Project window, a new MIDI track is created. This will be an exact copy of the original track for which you opened the Beat Designer.

Click here and drag to convert this subbank into separate MIDI parts.



Click here and drag to convert this pattern into a MIDI part.

- If you drag a single pattern into the Project window, one MIDI part is created containing the drum sounds of the pattern.
- If you drag a subbank into the Project window, several MIDI parts (one for each used pattern in the subbank) are created and inserted one after the other in the project.

⚠ Only the used patterns in a subbank are inserted, i.e. if you did not enter drum steps in a pattern, this will not be converted into a MIDI part.

You can also use the Edit menu to insert patterns or subbanks into the project, see “The Edit menu” on [page 43](#).

⚠ When you have created MIDI parts for your drum patterns this way, make sure to deactivate the Beat Designer, to avoid doubling of the drums. The Beat Designer will continue to play as long as it is activated.

- If you import patterns that sound before the first step (due to flams or lane offsets), the MIDI part will be lengthened accordingly.

The inserted MIDI parts can now be edited as usual in the project. You can e.g. fine-tune your settings in the Drum Editor.

⇒ Once a pattern is converted into a MIDI part, it cannot be opened in the Beat Designer again.

Triggering patterns

When you want to be able to modify your drum patterns in the Beat Designer while working on the project, you cannot convert them into parts, as these cannot be opened again in the Beat Designer. Instead, you can trigger the patterns from within the project.

You can trigger the patterns in the Beat Designer using Note On events. These can either be events on a MIDI track or be played live via a MIDI keyboard. Which pattern will be triggered depends on the pitch of the MIDI notes. The triggering range is four octaves starting with C1 (i.e. C1 to B4).

Proceed as follows:

1. Open the Beat Designer for a track. Again, this can be a MIDI or an instrument track.
2. Click to the left of the Jump field to activate Jump mode.

In this mode, a MIDI note-on event will trigger a new pattern.



Click here to activate Jump mode.

- When you want to trigger the patterns using a MIDI part containing trigger events, you can specify whether the pattern will be switched directly (at the moment the event is received) or at the next bar: Click in the field to the right (where it says “Now”) to activate the immediate switching of patterns. When this is activated, the word Now is displayed in white. When the word Now is black, patterns will switch at the beginning of the next bar in the project.

- When you want to trigger the patterns “live” via a MIDI keyboard, the new patterns are always played when the next bar in the project is reached.
Switching immediately would always produce an undesirable interruption in playback.

Now, you can trigger the patterns in the following way:

1. Play back the project and press a key on your MIDI keyboard to trigger the next pattern.
The pattern will start at the next bar line.

2. Create a MIDI part and enter notes at the positions in the project where you want to switch patterns.
Depending on the Jump mode setting, the new pattern will be played directly or start at the following bar.

- You can also drag a pattern or subbank into the Project when Jump mode is active to automatically create MIDI parts containing the trigger events.

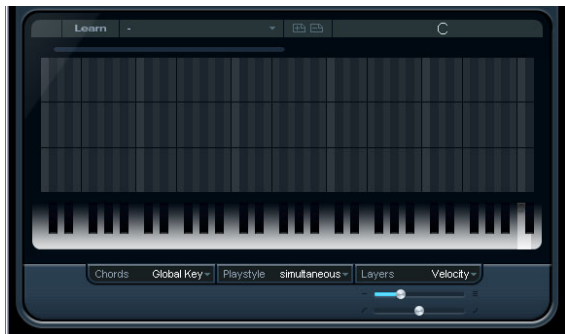
⇒ When triggering a pattern that contains sound before the first step (due to flams or lane offsets), these are taken into account as well.

Chorder

The Chorder is a MIDI chord processor, allowing you to assign complete chords to single keys in a multitude of variations. These can then be played back live or using recorded notes on a MIDI track.

There are three main operating modes: “All Keys”, “One Octave”, and “Global Key”. You can switch between these modes using the Chords pop-up, see below.

For every key you can record up to eight different chords or variations on so-called “layers”. This is described in detail in the section “[Using Layers](#)” on [page 47](#).



Operating modes

In the lower left section of the Chorder window, you can choose an option from the Chords pop-up menu to decide which keys in the keyboard display will be used to record your chords.

Global Key

In this mode, you can assign chords to each key on the keyboard display. When you play any of these keys, you will hear the assigned chords instead.

One Octave

The One Octave mode is similar to the All Keys mode, but you can only set up chords for each key of a single octave (that is, up to eight different chords on twelve keys). When you play a note (e.g. C) on a different octave, you will hear a transposed version of the chords set up for this key.

Global Key

In Global Key mode, you can set up chords for a single key only. These chords (that you recorded on C3) are then played by all keys on the keyboard, but transposed according to the note you play.

The chord indicator lane

At the top of the keyboard display you will find a thin lane with a small rectangle for each key that you can use to record a chord. These rectangles are shown in blue for all keys that already have chords assigned to them.



The chord indicator lane in One Octave mode with chords set up for 5 of the 12 available trigger keys.

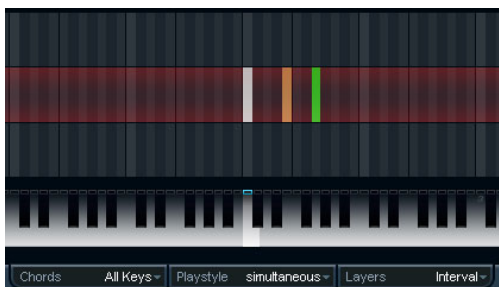
⇒ In Global Key mode the C3 key has a special marking instead since this is the only key used in this mode.

Entering chords

To enter chords you need to switch to Learn mode. In this mode a transparent red bar indicates which element is ready for “learning” a note or chord. When you choose the trigger note for a chord, for example, the keyboard display is shown in red.



The keyboard display in Learn mode



The second layer in Learn mode

Proceed as follows:

1. Click the Learn button at the top of the Chorder window to activate Learn mode.

The chord indicator lane is now tinted red, indicating that it is active.

2. Select the key to which you want to assign a chord by clicking on it on the keyboard display, or by pressing the key on a connected MIDI keyboard.

The red bar will now move to the first layer, indicating that you are ready to record the first chord.

⇒ In Global Key mode you do not have to choose a trigger key. The first layer is activated directly.

3. Play a chord on the MIDI keyboard and/or use the mouse to enter or change the chord in the layer display. Any notes you enter are immediately shown in the Chorder display. The notes are shown in different colors, depending on the pitch.

- If you are entering chords via a MIDI keyboard, the Chorder will learn the chord as soon as you release all keys of your MIDI keyboard simultaneously. As long as a key is pressed, you can continue looking for the right chord.

- If more than one layer is shown, the Chorder will jump automatically to the next layer where you can record another chord.

When all the layers for a key are filled, the red bar will jump back to the keyboard display so that you can choose a different trigger key (in Global Key mode the Learn mode is deactivated instead).

- If you are entering chords with the mouse, the Chorder will not jump to the next layer automatically. You can select/deselect as many notes as you wish and then click on another layer or deactivate the Learn mode to continue.

4. Repeat the above with any other keys you wish to use.

Using Layers

The Layers pop-up menu at the bottom right of the window allows you to set up chord variations in the layer display above the keyboard. This works with all three modes and provides up to eight variations for each assignable key (that is, a maximum of 8 different chords in Global Key mode, 12 x 8 chords in One Octave mode and 128 x 8 chords in All Keys mode).

The different layers can be triggered by velocity or interval. Proceed as follows to set up your layers:

1. Open the Layers pop-up menu and select Velocity or Interval. Set this to Single Mode if you want to set up only one chord per key.
2. Use the slider below the Layers pop-up menu to specify how many variations (layers) you want to use.
3. Enter the chords as described above.
4. Now you can play the keyboard and trigger the variations according to the selected layer mode.

The layer modes work as follows:

Trigger mode	Description
Velocity	<p>The full velocity range (1–127) is divided into “zones”, according to the number of layers you specified. For example, if you’re using two variations (Number of Layers is set to 2) there will be two velocity “zones”: 1–63 and 64–127. Playing a note with velocity 64 or higher will trigger the second layer, while playing a softer note will trigger the first layer.</p> <p>Using the “Velocity spread” slider at the bottom right of the window, you can change the velocity ranges of the layers so that a different layer will be activated using the same velocity value.</p>

Trigger mode	Description
Interval	In this mode, the Chorder will play one chord at a time – you cannot play several different chords simultaneously. When the Interval mode is selected, you press two keys on your keyboard to trigger the desired layer, with the lower key determining the base note for the chord. The layer number will be the difference, i.e. the interval, between the two keys. To select layer 1, press a key one semitone higher than the base note, for layer 2, press a key two semitones higher, and so on.
Single Mode	Select this if you do not wish to use different layers.

Empty layers

If you enter less chords than layers present for a key, these layers will be filled automatically when you end the Learn mode.

This works according to the following rules:

- Empty layers are filled from bottom to top.
- If there are empty layers below the first layer with a chord, these are filled from top to bottom.

An example:

If you have a setup with 8 layers, and you enter the chord C in layer 3 and G7 in layer 7, you get the following result: chord C in layers 1 to 6 and G7 in layers 7 and 8.

Resetting layers

In Learn mode, you can use the “Reset layers” button at the top left of the Chorder window to delete all notes in the different layers for the selected trigger key.



Playstyle

From the Playstyle pop-up menu at the bottom of the pane you can choose one of seven different styles that determine in which order the individual notes of the chords are played back.

The options are as follows:

Playstyle	Description
simultaneous	In this mode all notes are played back simultaneously.
fast up	In this mode a small arpeggio is added, starting with the lowest note.
slow up	Similar to “fast up”, but using a slower arpeggio.

Playstyle	Description
fast down	Similar to “fast up”, but starting with the highest note.
slow down	Similar to “slow up”, but starting with the highest note.
fast random	In this mode the notes are played back in a rapidly changing random order.
slow random	Similar to “fast random”, but the note changes occur more slowly.

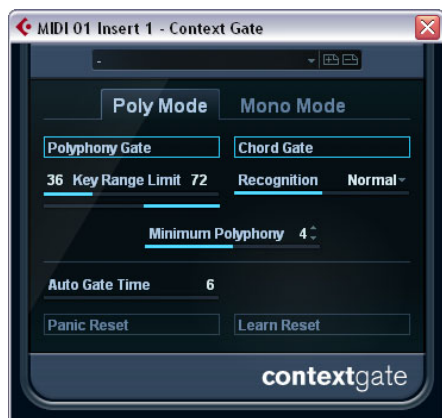
Compressor



This MIDI compressor is used for evening out or expanding differences in velocity. Though the result is similar to what you get with the Velocity Compression track parameter, the Compress plug-in presents the controls in a manner more like regular audio compressors. The parameters are:

Parameter	Description
Threshold	Only notes with velocities above this value will be affected by the compression/expansion.
Ratio	This determines the rate of compression applied to the velocity values above the threshold level. Ratios greater than 1:1 result in compression (i.e. less difference in velocity) while ratios lower than 1:1 result in expansion (i.e. greater difference in velocity). What actually happens is that the part of the velocity value that is above the threshold value is divided by the ratio value.
Gain	This adds or subtracts a fixed value from the velocities. Since the maximum range for velocity values is 0–127, you may need to use the Gain setting to compensate, keeping the resulting velocities within the range. Typically, you would use negative Gain settings when expanding and positive Gain settings when compressing.

Context Gate



The Context Gate allows for selective triggering/filtering of MIDI data. It features two modes: in Poly Mode the Context Gate recognizes certain chords that are played and in Mono Mode only certain MIDI notes are let through. These modes can be used for context selective control of MIDI devices and are, for example, very useful in certain live scenarios.

The following parameters are available:

Poly Mode – Polyphony Gate

This allows you to filter MIDI according to the number of pressed keys within a given key range. This can be used independently or in conjunction with the Chord Gate function.

- The Key Range Limit sliders are used to set the key range. Only notes within this range will be let through.
- The “Minimum Polyphony” value field allows you to specify the minimum number of notes required to open the gate.

Poly Mode – Chord Gate

When Chord Gate is activated, only notes in recognized chords are let through.

- Two Recognition modes are available: Simple and Normal. In Simple mode, all standard chords (major/minor/b5/dim/sus/maj7 etc.) are recognized, whereas Normal mode takes more tensions into account.

Mono Mode – Channel Gate

When this is activated, only single note events in a specified MIDI channel are let through, which can be used with MIDI controllers that can send MIDI over several channels simultaneously, for example guitar controllers which send data for each string over a separate channel.

- You can set Mono Channel to a specific channel (1–16), or to “Any”, i.e. no channel gating.

Mono Mode – Velocity Gate

This can be used independently or in conjunction with the Channel Gate function. Played notes will sound (no note-off message) until a note is played inside the set range (and additionally the set Channel Gate channel, if checked).

- The Key Range Limit sliders are used to set the key range. Only notes within this range will be let through.
- Notes below the Minimum Velocity threshold value will be gated.

Auto Gate Time

If there is no input activity, all resounding notes are sent a note-off message after the set time, in seconds or milliseconds.

Panic Reset button

Sends an “All Notes Off” message over all channels, in case of hanging notes.

Learn Reset button

When this is activated, you can specify a Reset trigger event via MIDI. Whenever this specific MIDI event is sent, it triggers an “All Notes Off” message. When you have set the Reset event, the Learn button should be deactivated.

Application examples

Poly Mode

In Poly mode, you could use the Context Gate to accompany yourself during a live guitar performance using a VST instrument. To do this, you might use a guitar to MIDI converter: You could then program the Context Gate, for example, to allow only those notes to pass the gate that are part of a four-note chord. During your performance you would then play a four-note chord every time that you want to trigger the VST instrument. The instrument will play until the Auto Gate Time is reached and fade out. For more complex performances this can be combined with an arpeggiator, without having to use external pedals to trigger the effect.

Mono Mode

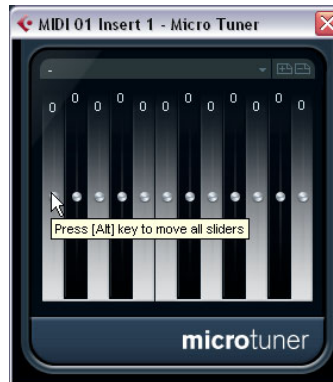
In Mono Mode you could use the Context Gate to trigger variations played with a drum machine/VST instrument. To do this, you will need a guitar to MIDI converter: You could then filter the MIDI channel using the Input Transformer (optional) and program the Context Gate to allow only certain notes on your guitar to pass the gate (e.g. beginning at the 12th band). When you now play one of these notes, the note-off command will not be sent out and the corresponding note will sound until the note is played again, a new note is let through, or the Auto Gate Time is reached. This way you can trigger lots of different effects or notes using the high notes on your guitar without having to use an additional MIDI instrument.

Density



This generic control panel affects the “density” of the notes being played from (or thru) the track. When this is set to 100%, the notes are not affected. Lowering the Density setting below 100% will randomly filter out or “mute” notes. Raising the setting above 100% will instead randomly add notes that have been played before.

Micro Tuner

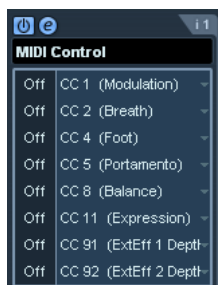


The Micro Tuner lets you set up a different microtuning scheme for the instrument, by detuning each key.

- Each Detune slider corresponds to a key in an octave (as indicated by the keyboard display). Adjust a Detune field to raise or lower the tuning of that key, in cents (hundreds of a semitone).
- By keeping the [Alt]/[Option] key pressed, you can adjust all keys by the same amount.

The Micro Tuner comes with a number of presets, including both classical and experimental microtuning scales.

MIDI Control



This generic control panel allows you to select up to eight different MIDI controller types, and use the value fields or sliders (which are displayed when you click on a value field while holding down the [Alt]/[Option] key) to set values for these. A typical use for this would be if you're using a MIDI instrument with parameters that can be controlled by MIDI controller data (e.g. filter cutoff, resonance, levels, etc.). By selecting the correct MIDI controller types, you can use the plug-in as a control panel for adjusting the sound of the instrument from within Cubase Essential, at any time.

- To select a controller type, use the pop-up menus to the right.
- To deactivate a controller slider, set it to "Off" (drag the slider all the way down).

MIDI Echo



This is an advanced MIDI Echo, which will generate additional echoing notes based on the MIDI notes it receives. It creates effects similar to a digital delay, but also features MIDI pitch shifting and much more. As always it is important to remember that the effect doesn't "echo" the actual audio, but the MIDI notes which will eventually produce the sound in the synthesizer.

The following parameters are available:

Velocity Offset

This parameter allows you to raise or lower the velocity values for each repeat so that the echo fades away or increases in volume (provided that the sound you use is velocity sensitive). For no change of velocity, set this to 0 (middle position).

Pitch Offset

If you set this to a value other than 0, the repeating (echoing) notes will be raised or lowered in pitch, so that each successive note has a higher or lower pitch than the previous. The value is set in semitones.

For example, setting this to -2 will cause the first echo note to have a pitch two semitones lower than the original note, the second echo note two semitones lower than the first echo note, and so on.

Repeats

This is the number of echoes (1 to 12) from each incoming note.

Beat Align

During playback, the Beat Align parameter quantizes the position of the first echo note. You can either set this to "rhythmically exact" values (displayed as note values – see the table below) or activate the PPQ button and choose a PPQ value.

Setting this to "1/8", for example, will cause the first echo note to sound on the first eighth position after the original note.

⇒ The echo time can also be affected by the Delay Decay parameter.

⇒ During live mode, this parameter has no effect since the first echo will always be played together with the note event itself.

Delay

The echoed notes will be repeated as set up with this parameter. You can either set this to “rhythmically exact” values (displayed as note values – see the table below) or activate the PPQ button and choose a PPQ value. This makes it easy to find rhythmically relevant delay values, but still allows experimental settings in between.

Delay Decay

This parameter lets you adjust how the echo time should be changed with each successive repeat. The value is set as a percentage.

- When set to 100% (middle position) the echo time will be the same for all repeats (as set with the Delay parameter).
- If you raise the value above 100%, the echoing notes will play with gradually longer intervals (i.e. the echo will become slower).
- If you lower the value below 100%, the echoing notes will become gradually faster, like the sound of a bouncing ball.

Length

This sets the length of the echoed notes. This can either be identical with the length of the original notes (parameter set to its lowest value) or the length you specify manually. You can either set this to “rhythmically exact” values (displayed as note values – see the table below) or activate the PPQ button and choose a PPQ value.

⇒ The length can also be affected by the Length Decay parameter.

Length Decay

This parameter lets you adjust how the length of the echoed notes should change with each successive repeat. The higher the setting (25–100), the longer the echoed notes will be, compared to their original notes.

About ticks and note values

The timing and position-related parameters (Delay, Length and Beat Align) can all be set in ticks (or PPQ which denotes the same thing here). There are 480 ticks to each quarter note. While the parameters allow you to step be-

tween the rhythmically relevant values (displayed as note values), the following table can also be of help, showing you the most common note values and their corresponding number of ticks:

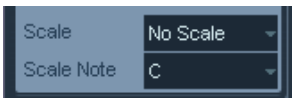
Note Value	Ticks
1/32 note	60
1/16 note triplet	90
1/16 note	120
1/8 note triplet	160
1/8 note	240
Quarter note triplet	320
Quarter note	480
Half note	960

MIDI Modifiers

This plug-in is essentially a duplicate of the MIDI Modifiers section in the Inspector. This can be useful, for example, if you need extra Random or Range settings.

The MIDI Modifiers effect also includes an additional function that isn’t available among the track parameters:

Scale Transpose



This allows you to transpose each incoming MIDI note, so that it fits within a selected musical scale. The scale is specified by selecting a key (C, C#, D, etc.) and a scale type (major, melodic or harmonic minor, blues, etc.).

⇒ To turn Scale Transpose off, select “No Scale” from the Scale pop-up menu.

MIDI Monitor



The MIDI Monitor is used to monitor incoming MIDI events. You can choose whether to analyze live or playback events and which types of MIDI data are to be monitored. Use this, for example, to analyze which MIDI events are being generated by a MIDI track, or to find “suspicious” events, such as notes with velocity 0 that certain MIDI devices might fail to interpret as note-off events.

Inputs section

In this section you can choose whether to monitor Live Events or Playback Events.

Show section

Here, you can activate/deactivate the different types of MIDI events, e.g. notes or program change events. If you choose the Controller option you can also define which type of controller to monitor.

Data table

In the table in the lower section of the window, you will see detailed information about the monitored MIDI events.

Buffer pop-up menu

In the Buffer pop-up menu you can set the buffer size to 100, 1000 or 10000 events. This is the maximum number of events that is kept in the list of monitored events. Once this list is full, the oldest entries will be deleted when new events are received.

⇒ The larger the buffer, the more processing resources are required. To avoid a negative impact on your system's performance, make sure to use the smallest possible buffer size.

Export function

Click the Export button to export the monitoring data as a simple text file.

Record events button

Use this button to the left of the Inputs section to start or stop the monitoring of MIDI events.

Clear list button

The Clear List button to the left of the Show section allows you to clear the table of recorded MIDI events.

Note to CC

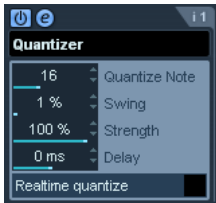


This effect will generate a MIDI continuous controller event for each incoming MIDI note. The value of the controller event corresponds to the velocity of the MIDI note, which is then used to control the selected MIDI controller (by default CC 7, Main Volume). For each note end, another controller event with the value 0 is sent. The incoming MIDI notes pass through the effect unaffected.

The purpose of this plug-in is to generate a gate effect. This means that the notes played are used to control something else. For example, if Main Volume (CC 7) is selected, notes with low velocity will lower the volume in the MIDI instrument, while notes with a high velocity will raise the volume.

⚠ Note that a controller event is sent out each time a new note is played. If high and low notes are played simultaneously, this may lead to confusing results. Therefore, the Note to CC effect is best applied to monophonic tracks (playing one note at a time).

Quantizer



Quantizing is a function that changes the timing of notes by moving them towards a “quantize grid”. This grid may consist of e.g. straight sixteenth notes (in which case the notes would all get perfect sixteenth note timing), but could also be more loosely related to straight note value positions (applying a “swing feel” to the timing, etc.).

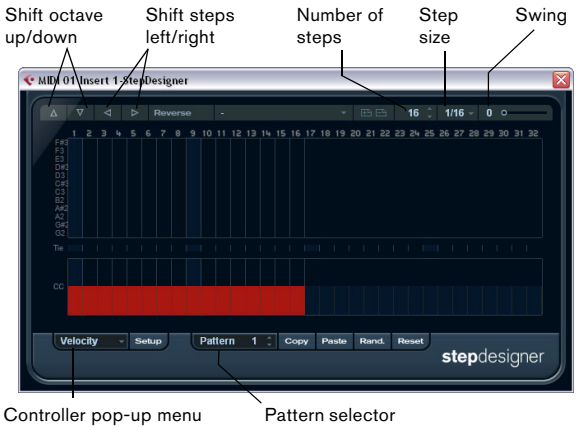
⇒ The main Quantize function in Cubase Essential is described in the Operation Manual.

While the Quantize function on the MIDI menu applies the timing change to the actual notes on a track, the Quantizer effect allows you to apply quantizing “on the fly”, changing the timing of the notes in real time. This makes it easier to try out different settings when creating grooves and rhythms. Note however, that the main Quantize function contains settings and features that are not available in the Quantizer.

The Quantizer has the following parameters:

Parameter	Description
Quantize Note	This sets the note value on which the quantize grid is based. Straight notes, triplets and dotted notes are available. For example, “16” means straight sixteenth notes and “8T” means eighth note triplets.
Swing	This allows you to offset every second position in the grid, creating a swing or shuffle feel. The value is a percentage – the higher you set this, the farther to the right every even grid position is moved.
Strength	This determines how close the notes should be moved to the quantize grid. When set to 100%, all notes will be forced to the closest grid position; lowering the setting will gradually loosen the timing.
Delay	This delays (positive values) or advances (negative values) the notes in milliseconds. Unlike the Delay setting in the Track Parameters, this delay can be automated.
Realtime quantize	During live mode this option can be used to change the timing of the notes played so that they fit the quantize grid.

Step Designer



The Step Designer is a MIDI pattern sequencer that sends out MIDI notes and additional controller data according to the pattern you set up. It does not make use of the incoming MIDI, other than automation data (such as recorded pattern changes).

Creating a basic pattern

1. Use the Pattern selector to choose which pattern to create.

Each Step Designer can hold up to 200 different patterns.

2. Use the “Step size” setting to specify the “resolution” of the pattern.

In other words, this setting determines how long each step is. For example, if this is set to “1/16” each step will be a sixteenth note.

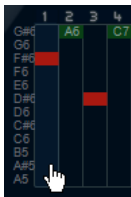
3. Specify the number of steps in the pattern with the “Number of steps” setting.

As you can see in the note display, the maximum number of steps is 32. For example, setting “Step size” to 16 and “Number of steps” to 32 would create a two bar pattern with sixteenth note steps.

4. Click in the note display to insert notes.

You can insert notes on any of the 32 steps, but the Step Designer will only play back the number of steps set with the Step size parameter.

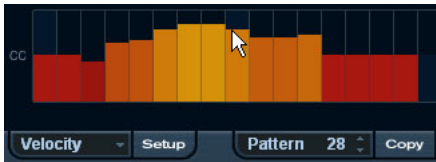
- The display spans one octave (as indicated by the pitch list to the left). You can scroll the displayed octave up or down by clicking in the pitch list and dragging up or down. This way you can insert notes at any pitch. Note that each step can contain one note only – the Step Designer is monophonic.



Click and drag to view other octaves.

- To remove a note from the pattern, click on it again.

5. On the Controller pop-up menu, select Velocity. This pop-up menu determines what is shown in the lower controller display.
6. Adjust the velocity of the notes by dragging the velocity bars in the controller display.



7. To make notes shorter, select “Gate” on the Controller pop-up menu and lower the bars in the controller display. When a bar is set to its maximum value (fully up), the corresponding note will be the full length of the step (as set with the Step size parameter).
8. To make notes longer, you can tie two notes together. This is done by inserting two notes and clicking in the Tie column for the second note. When two notes are tied, the second note will not be triggered – the previous note is lengthened instead. Also, the tied (second) note will automatically get the same pitch as the first note. You can add more notes and tie them in the same way, creating longer notes.
9. If you now start playback in Cubase Essential, the pattern will play as well, sending out MIDI notes on the track’s MIDI output and channel (or, if you have activated the Step Designer as a send effect, on the MIDI output and channel selected for the send in the Inspector).

Adding controller curves

- The Controller pop-up menu has two more items: two controller types.
- You can select which two controller types (filter cutoff, resonance, volume, etc.) should be available on the pop-up menu by clicking the Setup button and selecting controllers from the lists that appears. This selection is global, i.e. it applies to all patterns.
 - To insert controller information in a pattern, select the desired controller from the pop-up menu and click in the controller display to draw events.

The MIDI controller events will be sent out during playback along with the notes.



⇒ If you drag a controller event bar all the way down, no controller value is sent out on that step.

Other pattern functions

The following functions make it easier to edit, manipulate and manage patterns:

Function	Description
Shift Octave up/down	These buttons allow you to shift the entire pattern up or down in octave steps.
Shift Steps left/right	Moves the pattern one step to the left or right.
Reverse	Reverses the pattern, so that it plays backwards.
Copy/Paste	Allows you to copy the current pattern and paste it in another pattern location (in the same Step Designer instance or another).
Reset	Clears the pattern, removing all notes and setting controller values to default.
Randomize	Generates a completely random pattern – useful for experimenting.
Swing	The Swing parameter allows you to offset every second step, creating a swing or shuffle feel. The value is a percentage – the higher you set this, the farther to the right every even step is moved.
Presets	Handling of presets is described in the chapter “MIDI real-time settings” in the Operation Manual. Note that a stored Preset contains all 200 patterns in the Step Designer.

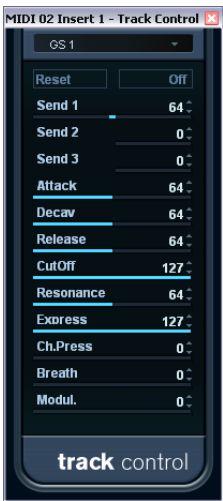
Automating pattern changes

You can create up to 200 different patterns in each Step Designer – just select a new pattern and add notes and controllers as described above.

Typically, you want the pattern selection to change during the project. You can accomplish this by automating the Pattern selector, either in real time by activating the Write automation and switching patterns during playback or by drawing in the automation track for the Step Designer's MIDI track. Note that you can also press a key on your MIDI keyboard to change patterns. For this, you have to set up the Step Designer as an insert effect for a record enabled MIDI track. Press C1 to select pattern 1, C#1 to select pattern 2, D1 to select pattern 3, D#1 to select pattern 4 and so on. If you want, you can record these pattern changes as note events on a MIDI track. Proceed as follows:

1. Select the desired MIDI track or create a new one and activate the Step Designer as an insert effect.
 2. Set up several patterns as described above.
 3. Press the Record button and press the desired keys on your keyboard to select the corresponding patterns. The pattern changes will be recorded on the MIDI track.
 4. Stop recording and play back the MIDI track. You will now hear the recorded pattern changes.
- ⇒ This will only work for the first 92 patterns.

Track Control



The Track Control effect contains three ready-made control panels for adjusting parameters on a GS or XG compatible MIDI device. The Roland GS and Yamaha XG protocols are extensions of the General MIDI standard, allowing for more sounds and better control of various instrument settings. If your instrument is compatible with GS or XG, the Track Controls effect allows you to adjust sounds and effects in your instrument from within Cubase Essential.

Selecting a control panel

At the top of the Track Controls effect window you will find a pop-up menu. This is where you select which of the available control panels to use:

Control panel	Description
GS 1	Effect sends and various sound control parameters for use with instruments compatible with the Roland GS standard.
XG 1	Effect Sends and various sound control parameters for use with instruments compatible with the Yamaha XG standard.
XG 2	Global settings (affecting all channels) for instruments compatible with the Yamaha XG standard.

About the Reset and Off buttons

Regardless of the selected mode, you will find two buttons labelled “Off” and “Reset” at the top of the control panel:

- Clicking the Off button will set all controls to their lowest value, without sending out any MIDI messages.
- Clicking the Reset button will set all parameters to their default values, and send out the corresponding MIDI messages.

For most parameters, the default values will be zero or “no adjustment”, but there are exceptions to this. For example, the default “Send 1” setting is 64.

GS 1

The following controls are available when the GS 1 Controls mode is selected:

Control	Description
Send 1	Send level for the reverb effect.
Send 2	Send level for the chorus effect.
Send 3	Send level for the “variation” effect.
Attack	Adjusts the attack time of the sound. Lowering the value shortens the attack, while raising it gives a slower attack. Middle position (64) means no adjustment is made.
Decay	Adjusts the decay time of the sound. Lowering the value shortens the decay, while raising it makes the decay longer.
Release	Adjusts the release time of the sound. Lowering the value shortens the release, while raising it makes the release time longer.
Cutoff	Adjusts the filter cutoff frequency.
Resonance	Adjusts the filter resonance.
Express	Allows you to send out expression pedal messages on the track’s MIDI channel.
Ch. Press.	Allows you to send out aftertouch (channel pressure) messages on the track’s MIDI channel. This is useful if your keyboard cannot send aftertouch, but you have sound modules that respond to aftertouch. The default value for this parameter is zero.
Breath	Allows you to send breath control messages on the track’s MIDI channel.
Modul.	Allows you to send modulation messages on the track’s MIDI channel (just as you normally do with a modulation wheel on a MIDI keyboard).

XG 1

The following controls are available when the XG 1 mode is selected:

Control	Description
Send 1	Send level for the reverb effect.
Send 2	Send level for the chorus effect.
Send 3	Send level for the “variation” effect.
Attack	Adjusts the attack time of the sound. Lowering this value shortens the attack, while raising it gives a slower attack. Middle position means no adjustment is made.
Release	Adjusts the release time of the sound. Lowering this value shortens the release, while raising it makes the release time longer. Middle position means no adjustment is made.
Harm.Cont	Adjusts the harmonic content of the sound.
Bright	Adjusts the brightness of the sound.
CutOff	Adjusts the filter cutoff frequency.
Resonance	Adjusts the filter resonance.

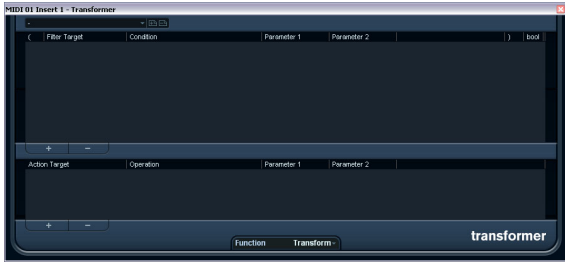
XG 2

In this mode, the parameters affect global settings in the instrument(s). Changing one of these settings for a track will in fact affect all MIDI instruments connected to the same MIDI output, regardless of the MIDI channel setting of the track. Therefore, to avoid confusion it might be a good idea to create an empty track and use this only for these global settings.

The following controls are available:

Control	Description
Eff. 1	This allows you to select which type of reverb effect should be used: No effect (the reverb turned off), Hall 1–2, Room 1–3, Stage 1–2 or Plate.
Eff. 2	This allows you to select which type of chorus effect should be used: No effect (the chorus turned off), Chorus 1–3, Celeste 1–3 or Flanger 1–2.
Eff. 3	This allows you to select one of a large number of “variation” effect types. Selecting “No Effect” is the same as turning off the variation effect.
Reset	Sends an XG reset message.
MastVol	This is used to control the Master Volume of an instrument. Normally you should leave this in its highest position and set the volumes individually for each channel (with the volume faders in the Cubase Essential mixer or in the Inspector).

Transformer



With the Transformer you can perform very powerful MIDI processing on the fly, without affecting the actual MIDI events on the track.

Setting up filter conditions

Filter Target	Condition	Parameter 1	Parameter 2	bool
Type is	Equal	Note	1	And
Channel	Equal			

The upper list is where you set up the filter conditions, determining which elements to find. The list can contain one or several conditions, each on a separate line.

- To add a new condition, click the Add button (+) below the list.

A new line is added at the bottom of the list. If there are many lines, you may need to use the scrollbar to the right to view them.

- To remove a condition, select it and click the Delete button (-) below the list.

⇒ If you have already defined filter conditions and/or applied a preset, but want to start again from scratch, you can initialize the settings by selecting the Init option from the Presets pop-up menu.

You set up a filter condition line by clicking in the columns and selecting options from the pop-up menus that appear. Here is a brief description of the columns:

Column	Description
Left bracket	This is used for “bracketing” several lines together when creating conditions with multiple lines and the boolean operators And/Or, see “Combining multiple condition lines” on page 60.
Filter Target	Here you select which property to look for when finding events. Your choice here affects the available options in the other columns as well, see below.

Column	Description
Condition	This determines how the Transformer should compare the property in the Filter Target column to the values in the Parameter columns (Equal, Unequal, Bigger, etc. – see the separate table below). The available options depend on the Filter Target setting.
Parameter 1	Here you set which value the event properties should be compared to (a numeric value or a choice from a pop-up menu, depending on the Filter Target).
Parameter 2	This column is only used if you have selected one of the “Range” options in the Condition column. Typically, this allows you to find all events with values inside (or outside) the range between Parameter 1 and Parameter 2.
Right bracket	This is used for “bracketing” several lines together, see “Combining multiple condition lines” on page 60.
bool	This allows you to insert the boolean operators And/Or, when creating conditions with multiple lines, see “Combining multiple condition lines” on page 60.

Conditions

Depending on the Filter Target setting, the following options can be selected in the Condition column:

Condition	Events will be found if their Filter Target property...
Equal	...has the exact same value as set up in the Parameter 1 column.
Unequal	...has any value other than the one set up in the Parameter 1 column.
Bigger	...has a value higher than the one set up in the Parameter 1 column.
Bigger or Equal	...has a value that is the same as or higher than the one set up in the Parameter 1 column.
Less	...has a value lower than the one set up in the Parameter 1 column.
Less or Equal	...has a value that is the same as or lower than the one set up in the Parameter 1 column.
Inside Range	...has a value that is between the values set up in the Parameter 1 and Parameter 2 columns. Note that Parameter 1 should be the lower value and Parameter 2 the higher.
Outside Range	...has a value that is not between the values set up in the Parameter 1 and Parameter 2 columns.
Note is equal to	...is the note specified in the Parameter 1 column, regardless of octave (Pitch only). Lets you find e.g. all C notes, in all octaves.

⇒ The Conditions for the “Property” filter target are different, see [“Searching for properties”](#) on page 60.

Below, the different Filter Targets (and their corresponding Condition and Parameter options) are described in more detail.

Searching for Value 1 or Value 2

A MIDI event is composed of several values. What is displayed for Value 1 and 2 depends on the type of event:

Event type	Value 1	Value 2
Notes	The Note Number/Pitch.	The velocity of the note.
PolyPressure	The key that was pressed.	The amount of pressure for the key.
Controller	The type of Controller, displayed as a number.	The amount of Control Change.
Program Change	The Program Change number.	Not used.
Aftertouch	The amount of pressure.	Not used.
Pitchbend	The "fine tune" of the bend. Not always used.	The coarse amount of bend.

⇒ System Exclusive events are not included in the table above, since they do not use value 1 and 2.

Since value 1 and 2 have different meanings for different events, searching for value 2 = 64, for example, would both find notes with the velocity 64 and controllers with the amount 64, etc. If this is not what you want, you can add an additional filter condition line with the Filter Target "Type", specifying which type of events to find (see below).

⚠ This is particularly useful when searching for note pitch or velocity values, as described below.

The general procedures when searching for value 1 or 2 are:

- If you select any Condition other than the Range options, you set up a specific value in the Parameter 1 column.

Filter Target	Condition	Parameter 1	Parameter 2	boot
Value 2	less		80	

Here, the Transformer will find all events with a value 2 less than 80.

- If you select Inside Range or Outside Range in the Condition column, the range consists of the values between Parameter 1 and Parameter 2.

Note that Parameter 1 should have the lower value.

Searching for note pitch or velocity

If you add another condition line with the Filter Target "Type", Condition "Equal" and Parameter 1 set to "Note", the Transformer will "know" you are searching for pitch or velocity. This has the following benefits:

- The Filter Targets Value 1 and Value 2 will be displayed as "Pitch" and "Velocity" respectively, making it easier to grasp the function of the filter condition.
- Pitch values in the Parameter columns will be displayed as note names (C3, D#4, etc.). When entering pitch values you can either type a note name or a MIDI note number (0–127).
- When Value 1 (pitch) is selected as Filter Target, an additional option appears in the Condition column: "Note is equal to". When this is selected, you specify a note name in the Parameter 1 column but without any octave number (C, C#, D, D#, etc.). The Transformer can then find all notes of a certain key, in all octaves.

See ["Combining multiple condition lines"](#) on [page 60](#) for more info on working with multiple filter condition lines.

Searching for controllers

There is similar extended functionality when searching for controllers: If you've added an additional "Type = Controller" condition line, the Transformer will "know" you are searching for controllers. The Parameter 1 column will then show the names of the MIDI controllers (Modulation, Volume, etc.) when Value 1 is selected as Filter Target.

Searching for MIDI channels

Each MIDI event contains a MIDI channel setting (1–16). Normally, these settings are not used, since the MIDI event plays back on the MIDI channel set for its track. However, you can come across MIDI parts with events set to different channels, for example in the following scenarios:

- If you have recorded MIDI from an instrument sending on several different channels (e.g. a master keyboard with different key zones).
- If you have imported a MIDI file of type 0 (with a single track, containing MIDI events with different channel settings).

Searching for MIDI channel values is straightforward; you select a Condition and enter a MIDI channel (1–16) in the Parameter 1 column (and, if you've selected one of the Range Conditions, a higher channel in the Parameter 2 column, creating a value range).

Searching for element types

Selecting Type as the Filter Target allows you to find elements of a certain type only.

- The Condition column contains only three options: Equal, Unequal and All Types.
- Clicking the Parameter 1 column displays a pop-up menu, listing the available types (Note, Poly Pressure, Controller, etc.).

The Transformer will find all elements matching or not matching the selected type (depending on the Condition).

⚠ As mentioned above, selecting Type = Note or Type = Controller adds some additional functionality to the Transformer. You should make it a habit to add a Type condition when applicable.

Searching for properties

On the Filter Target pop-up menu, you will find an option called Property. This allows you to search for properties that are not part of the MIDI standard but rather Cubase Essential-specific settings.

When the Property option is selected, the Condition column has two options: “Property is set” and “Property is not set”. Which property to look for is selected in the Parameter 1 column. The options are “muted” and “selected”. Two examples:

Filter Target	Condition	Parameter 1	Parameter 2	bool
Property	Property is set	Event is muted		

Here, the Transformer will find all muted events.

Filter Target	Condition	Parameter 1	Parameter 2	bool
Property	Property is set	Event is selected		And
Property	Property is set	Event is muted		

Here, the Transformer will find all events that are selected and muted.

Searching for event contexts

On the Filter Target pop-up menu, you will find an option called “Last Event”. This can be used to perform context-dependent searches.

“Last Event” indicates the state of an event which has already passed the Transformer. The condition has to be combined with Parameter 1 and Parameter 2.

Below, you will find a few examples on how the Last Event filter target can be used.

Here, the action will only be performed when the sustain pedal is down:

Filter Target	Condition	Parameter 1	Parameter 2
Last Event	Equal	MIDI Status	176/Controller
Last Event	Equal	Value 1	64
Last Event	Bigger	Value 2	64

In this example, the action will be performed when the note C1 is playing:

Filter Target	Condition	Parameter 1	Parameter 2
Type is	Equal	Note	
Last Event	Equal	Note is playing	36/C1

In this example, the action will be performed after playing the C1 note:

Filter Target	Condition	Parameter 1	Parameter 2
Last Event	Equal	Value 1	36/C1

Combining multiple condition lines

As described above, you can add condition lines by clicking the Add (+) button below the list. The result of combining condition lines depends on the boolean And/Or operators and the brackets.

The bool column

- By clicking in the “bool” column to the right in the list, you can select a boolean operator: “And” or “Or”. A boolean operator combines two condition lines and determines the result in the following way:
- If two condition lines are combined with a boolean And, both conditions must be fulfilled for an element to be found.

Filter Target	Condition	Parameter 1	Parameter 2	bool
Type is	Equal	Note		And
Property	Property is set	Event is muted		

The Transformer will only find events that are notes and are muted.

If two condition lines are combined with a boolean Or, one of the conditions (or both) must be fulfilled for an element to be found.

Filter Target	Condition	Parameter 1	Parameter 2	Bool
Type is	Equal	Note		And
Property	Property is set	Event is muted		Or

The Transformer will find all events that are notes (regardless of mute status) and all events that are muted (regardless of their type).

When you add a new condition line, the boolean setting defaults to And. Therefore, if all you want to do is set up two or more conditions that all must be met for an element to be found, you do not have to think about the boolean column – just add the required lines and make the usual filter settings.

Using brackets

The bracket (parenthesis) columns let you enclose two or more condition lines, dividing the conditional expression into smaller units. This is only relevant when you have three or more condition lines and want to use the boolean Or operator. This is how it works:

- Without brackets, the conditional expressions are evaluated according to their order in the list.

Filter Target	Condition	Parameter 1	Parameter 2	Bool
Type is	Equal	Note		And
Property	Property is set	Event is muted		Or
Channel	Equal	1		

In this case we have the expression Type = Note AND Event is muted OR Channel = 1, without brackets. This means that the Transformer will find all muted MIDI notes, as well as events (regardless of their type) set to MIDI channel 1.

Maybe you wanted to find all notes that are either muted or use the MIDI channel 1 (but no non-note events)? Then you need to add some brackets:

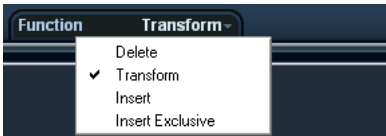
Filter Target	Condition	Parameter 1	Parameter 2	Bool
Type is	Equal	Note		And
Property	Property is set	Event is muted		Or
Channel	Equal	1		

Here the expression is Type = Note AND (Event is muted OR Channel = 1), which will find what you want. The rule behind this is:

- Expressions within brackets are evaluated first.
- If there are several layers of brackets, these are evaluated “from the inside out”, starting with the innermost brackets.

You add brackets by clicking in the bracket columns and selecting an option. Up to triple brackets can be selected.

Selecting a function



The Function pop-up menu at the bottom of the Transformer is where you select the function – the basic type of editing to be performed.

The following options are available:

Delete

This function will remove (or “mute”) all found elements from the “output stream” – the actual elements on the track are not affected.

Transform

Changes one or several aspects of the found elements. You set up exactly what should be changed in the action list, see “[Specifying actions](#)” on [page 62](#).

Insert

This will create new elements and insert these into the output stream. The new elements will be based on the elements found by the Transformer effect’s filter conditions, but with any changes you have set up in the action list applied.

Another way of expressing this is that the Insert function copies the found elements, transforms them according to the action list and inserts the transformed copies among the existing elements.

Insert Exclusive

This will transform the found elements according to the action list. Then, all elements that were not found (that did not meet the filter conditions) are removed from the output stream.

Specifying actions

Action Target	Operation	Parameter 1	Parameter 2
Value 1	Set to fixed value	D=2	

The lower list in the Transformer window is the action list. This is where you specify any changes that should be made to the found events (relevant for all function types except Delete).

The handling of the action list is similar to the filter condition list, but without the brackets and booleans. You simply add lines by clicking the Add button (+) below the list, and fill out the columns as required. To remove a superfluous action line, select it and click the Delete button (-).

Action Target

This is where you select the property that should be changed in the events:

Option	Description
Value 1	This adjusts value 1 in the events. As described in the section “Searching for Value 1 or Value 2” on page 59 , the property of value 1 depends on the event type. For notes, value 1 is the pitch.
Value 2	This adjusts value 2 in the events. As described in the section “Searching for Value 1 or Value 2” on page 59 , the property of value 2 depends on the event type. For notes, value 2 is the velocity value.
Channel	Allows you to change the MIDI channel setting, see “Searching for MIDI channels” on page 59 .
Type	Allows you to change an event from one type to another, e.g. transform aftertouch events to modulation events.
Value 3	This adjusts value 3 in the events, which is used for handling note-off velocity when searching for properties, see “Searching for properties” on page 60 .

Operation

This setting determines what to do with the Action Target. The options on this pop-up menu are different depending on the selected Action Target. Below, all available operations are listed:

Add

Adds the value specified in the Parameter 1 column to the Action Target.

Subtract

Subtracts the value specified in the Parameter 1 column from the Action Target.

Multiply by

Multiplies the Action Target value with the value specified in the Parameter 1 column.

Divide by

Divides the Action Target value by the value specified in the Parameter 1 column.

Round by

This “rounds” the Action Target value using the value specified in the Parameter 1 column. In other words, the Action Target value is changed to the closest value that can be divided by the Parameter 1 value.

Set Random Values between

This will set the Action Target value to a random value within the range specified with Parameter 1 and 2.

Set Relative Random Values between

This will add a random value to the current Action Target value. The added random value will be within the range specified with Parameter 1 and 2. Note that these can be set to negative values.

For example, if you set Parameter 1 to -20 and Parameter 2 to +20, the original Action Target value will get a random variation, never exceeding ± 20 .

Set to fixed value

This sets the Action Target to the value specified in the Parameter 1 column.

Transpose to Scale

This is only available when Action Target is set to Value 1, and when the filter conditions are specifically set up to find notes (a “Type = Note” filter condition line has been added). When “Transpose to Scale” is selected, you can specify a musical scale using the Parameter 1 and 2 columns. Parameter 1 is the key (C, C#, D, etc.) while Parameter 2 is the type of scale (major, melodic or harmonic minor, etc.).

Each note will be transposed to the closest note in the selected scale.

Use Value 2

This is only available when Action Target is set to Value 1. If this option is selected, the Value 2 setting in each event will be copied to the Value 1 setting.

For example, this would be useful if you are transforming all Modulation controllers to Aftertouch events (since controllers use Value 2 for their amount, while Aftertouch uses Value 1 – see [“Searching for Value 1 or Value 2”](#) on [page 59](#)).

Use Value 1

This is only available when Action Target is set to Value 2. If this option is selected, the Value 1 setting in each event will be copied to the Value 2 setting.

Mirror

This is only available when Action Target is set to Value 1 or Value 2. When this option is selected, the values will be “mirrored” around the value set in the Parameter 1 column.

In the case of notes, this will invert the scale, with the key set in the Parameter 1 column as “center point”.

Applying the defined actions

When using the Transformer effect, the processing is applied to the events played back from the track (or played live “thru” the track) as soon as you set it up.

Since no existing events on the track are affected by the Transformer setting, there is no need for undo.

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